

AU-A134 836

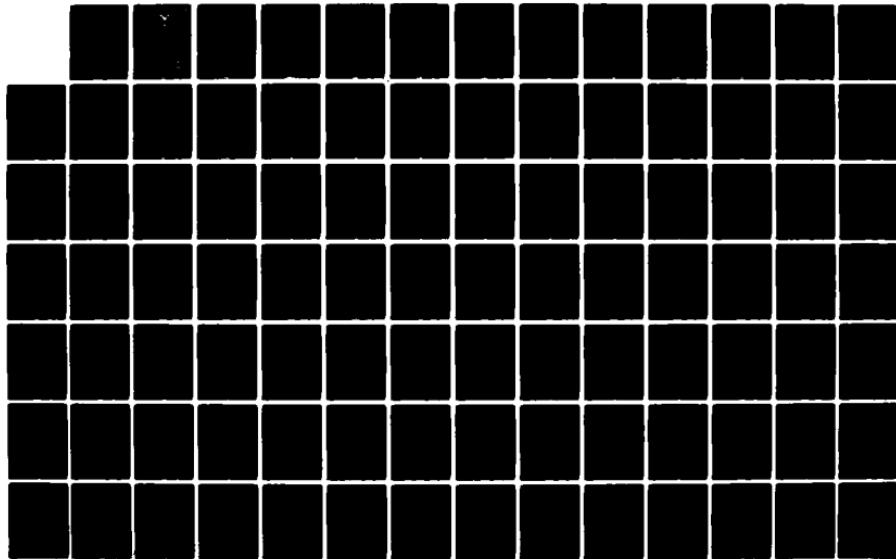
MINUTEMAN MISSILE MAINTENANCE AND ENLISTED CAREER
PROGRESSION PROBLEMS(U) AIR FORCE INST OF TECH
WRIGHT-PATTERSON AFB OH SCHOOL OF SYST.. D R FORBES

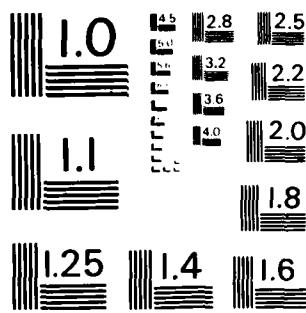
UNCLASSIFIED SEP 83 AFIT-LSSR-24-83

1/2-

F/G 5/9

NL





MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS - 1963 - A

AD-A134336



MINUTEMAN MISSILE MAINTENANCE AND
ENLISTED CAREER PROGRESSION PROBLEMS

Donald R. Forbes, Captain, USAF

LSSR 24-83

This document has been approved
for public release and sale; its
distribution is unlimited.

DTIC
SELECTED
NOV 3 1983
S A D

DEPARTMENT OF THE AIR FORCE
AIR UNIVERSITY
AIR FORCE INSTITUTE OF TECHNOLOGY

DTIC FILE COPY

Wright-Patterson Air Force Base, Ohio

83 11 03 079

MINUTEMAN MISSILE MAINTENANCE AND
ENLISTED CAREER PROGRESSION PROBLEMS

Donald R. Forbes, Captain, USAF

LSSR 24-83

This document has been approved
for public release and sale; its
distribution is unlimited.

The contents of the document are technically accurate, and no sensitive items, detrimental ideas, or deleterious information are contained therein. Furthermore, the views expressed in the document are those of the author(s) and do not necessarily reflect the views of the School of Systems and Logistics, the Air University, the Air Training Command, the United States Air Force, or the Department of Defense.



A-1

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER LSSR 24-83	2. GOVT ACCESSION NO. AD-A134 336	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) MINUTEMAN MISSILE MAINTENANCE AND ENLISTED CAREER PROGRESSION PROBLEMS		5. TYPE OF REPORT & PERIOD COVERED Master's Thesis
7. AUTHOR(s) Donald R. Forbes, Captain, USAF		6. PERFORMING ORG. REPORT NUMBER
9. PERFORMING ORGANIZATION NAME AND ADDRESS School of Systems and Logistics Air Force Institute of Technology, WPAFB OH		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS Department of Communication AFIT/LSH, WPAFB OH 45433		12. REPORT DATE September 1983
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office)		13. NUMBER OF PAGES 129
		15. SECURITY CLASS. (of this report) UNCLASSIFIED
		15a. DECLASSIFICATION/DOWNGRADING SCHEDULE 25 SEP 1983
16. DISTRIBUTION STATEMENT (of this Report) Approved for public release; distribution unlimited		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES Approved for public release: IAW AFR 190-17. Lorraine E. WOLVER Dean for Research and Professional Development Air Force Institute of Technology (ATC) Wright-Patterson AFB OH 45433		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) Careers Personnel Development Enlisted Personnel Guided Missile Personnel Minuteman Maintenance		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) Thesis Chairman: Mr. Jerome G. Peppers, GM-15		

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE(When Data Entered)

The Minuteman missile weapon system is an important component of the Triad, our nations' deterrent forces. Effective maintenance of this system is important to ensure it is able to meet mission requirements. Maintenance includes inspection, testing, servicing, classification as to serviceability, repair, modification, and reclamation. The key to successful maintenance is a stable, weapon system-experienced maintenance work force. The enlisted personnel responsible for performing the maintenance actions are part of a three-tier enlisted force organization and progress through the Air Force promotion system. Through career progression in this system, personnel are required to move from technically oriented "hands on" work to supervisory and management oriented positions. Previous research has indicated that this transition is a problem area in aircraft maintenance. This research examined the responses of 143 Minuteman maintenance personnel when asked what can be done to improve missile maintenance. The statements they made were used to develop a problem scheme and were analyzed for relevance to the technician to supervisor transition. This forced transition was only mentioned by a few of the personnel and appeared to be of relatively small significance in the total Minuteman maintenance environment.

UNCLASSIFIED

SECURITY CLASSIFICATION OF THIS PAGE(When Data Entered)

LSSR 24-83

MINUTEMAN MISSILE MAINTENANCE AND ENLISTED
CAREER PROGRESSION PROBLEMS

A Thesis

Presented to the Faculty of the School of Systems and Logistics
of the Air Force Institute of Technology
Air University

In Partial Fulfillment of the Requirements for the
Degree of Master of Science in Systems Management

By

Donald R. Forbes, BA
Captain, USAF

September 1983

Approved for public release;
distribution unlimited

This thesis, written by

Captain Donald R. Forbes

has been accepted by the undersigned on behalf of the faculty of the School of Systems and Logistics in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE IN LOGISTICS MANAGEMENT

DATE: 28 September 1983

COMMITTEE CHAIRMAN

ACKNOWLEDGEMENTS

I wish to express my deepest appreciation to my wife, Judy, for her help in sorting the data, typing the drafts, and meeting the needs of our three young children.

I also wish to thank my advisor, Mr. Jerome G. Peppers, for his patience, professional advice, and guidance. I thank the personnel of the Logistics and Technical Training Division of the Air Force Human Resources Laboratory for their efforts in obtaining the data base.

I extend thanks to Phyllis Reynolds for her willingness to type the final thesis copy in the last days before thesis deadlines.

TABLE OF CONTENTS

	Page
ACKNOWLEDGEMENTS	iii
LIST OF TABLES	ix
LIST OF FIGURES	x
CHAPTER	
I. INTRODUCTION	1
The Nation	1
The Air Force and Deterrence	3
Maintenance Personnel	7
The Enlisted Force Organization	10
The Technician to Supervisor Transition	13
Problem Statement	16
Research Objectives	18
Research Questions	18
II. MISSILE MAINTENANCE ENVIRONMENT	19
Introduction	19
Maintenance Support Division	23
Maintenance Control Division	23
Training Control Division	24
Quality Control Division	24
Missile Maintenance Squadrons	25
Minuteman Missile Maintenance Dispatches	27

CHAPTER	Page
III. NCO PROFESSIONAL MILITARY EDUCATION	32
Introduction	32
Phase I--NCO Orientation Course	32
Phase II--USAF Supervisors Course	33
Phase III--NCO Leadership School	35
Phase IV--NCO Academy	38
Phase V--USAF Senior NCO Academy	40
Conclusion	40
IV. METHODOLOGY	42
Introduction	42
Background to AF/HRL Study	42
Quality Circles	44
Data Collection Instrument	46
Missile Maintenance Data	51
Data Analysis	52
V. RESULTS	58
Introduction	58
Competence Categories Reviewed	75
1-1 Technicians	75
1-2 Supervisors	75
1-3 Officers	76
1-7 Experience	76
1-8-1 Training, Tech School	77
1-8-2 Training, OJT	78

CHAPTER	Page
1-8-3 Training, FTD	78
1-8-6 Training, Management/PME	78
Motivation/Morale Categories Reviewed	79
2-1 Job-Task Satisfaction	79
2-2 Career Field Satisfaction	80
2-3 Job Status Visibility	80
2-4 Desire to do Responsible, Meaningful Work	81
2-5 Desire to do a Complete Job	81
2-6 Job Involvement/Caring/ Retiring on the Job	81
2-7 Unit Identification/Affiliation/ Pride	82
2-8 Respect for Supervisor/Role Models . . .	82
2-9-2 Feedback, Evaluation/ Approval/Appreciation	82
2-11-1 Cooperation/Competition/ Conflict, Within Maintenance	83
2-12-1 Discipline, Excessive	83
2-19-5 Discrimination, Rank	84
Work Environment Categories Reviewed	84
5-2-1-1 Supervisory Style/ Techniques, NCOs	84
5-2-1-4 Supervisory Style/Techniques, DCM and Higher Management	85
5-2-2-2 Work Pressure, Requirements for Perfection	86
5-2-2-6 Work Pressure, Length of Work Days/Weeks/Shifts	87

CHAPTER	Page
5-2-2-7 Work Pressure, Inspections (ORI, ORE, CAFE, QC, MSEP)	88
5-2-3-7 Work Distractions/Non-Primary Duties, Administrative Paperwork	88
5-2-4 Vertical Communication	89
5-3-1-4 Maintenance Organization Structure, Job Control	90
5-3-1-5 Maintenance Organization Structure, QC	90
5-3-2-1 Job Structure, AFSCs	90
5-3-2-2 Job Structure, Duties Within AFSCs	91
5-3-2-4 Job Structure, Unwanted Supervisory Role	91
5-4-1 Manpower Availability, Technicians	93
5-4-2 Manpower Availability, Supervisors	93
Personnel Policy	94
6-2-1 Promotion, Criteria/APRs	94
6-2-6 Promotion, Career Path Availability	84
6-3 Assignment (AFSC, Primary Job)	95
6-4 Retention	95
6-5-2 Transfer (PCS), Location	96
6-5-4 Transfer (PCS), Duration of Stay	96
Summary	97
VI. CONCLUSIONS AND RECOMMENDATIONS	99

	Page
APPENDIX: DATA COLLECTION FORMS	102
SELECTED BIBLIOGRAPHY	107
A. REFERENCES CITED	108
B. RELATED SOURCES	112
BIOGRAPHICAL SKETCH OF THE AUTHOR	115

LIST OF TABLES

Table	Page
1-1 Air Force Grades per Skill Level	9
4-1 Minuteman Maintenance Enlisted Force Strength and Sample Size	53
5-1 Competence Line Unit Summaries	59
5-2 Motivation/Morale Line Unit Summaries	61
5-3 Equipment Support Line Unit Summaries	64
5-4 Methods Support Line Unit Summaries	66
5-5 Work Environment Line Unit Summaries	67
5-6 Personnel Policy Line Unit Summaries	71
5-7 Major Area and Tier Line Unit Summaries	74

LIST OF FIGURES

Figure	Page
2-1 Minuteman Wing Maintenance Organization	20
2-2 Field Missile Maintenance Squadron	21
2-3 Organizational Missile Maintenance Squadron . . .	22
4-1 Interview Procedures with Sample Questions . . .	47
4-2 Technician Needs	48
4-3 Summary Sheet	55
4-4 Tier Tracking Sheet	56

CHAPTER I

INTRODUCTION

The Nation

Our nation is made up of people who are bound together by several common characteristics, such as history, culture, customs, language, values, political aspirations, and sense of homogeneity (Cohen, 1983:9). We establish national objectives that specify detailed goals for which national action is planned (Cason, 1983:44). These objectives are pursued to insure the continued welfare of our people. Air Force Manual (AFM) 1-1, Functions and Basic Doctrine of the United States Air Force, states "Our basic national security objective to preserve the United States as a free nation with its fundamental institutions and values intact [1979:p.1-1]."

The nation relies on its power to pursue this objective. There are different listings of the factors that make up national power (Morgenthau, 1967:106-144; Hartman, 1967:41-65). Organski has specified two areas: natural, including geography, natural resources and population; and social, including economic and political development, and national morale. He specifies that "to be considered a determinant of power, a social or a natural

phenomenon must increase the ability of a nation to influence the behavior of other nations [1968:124-154]." The above components are related: "No single factor is responsible for power; each plays a part, and each affects the others. A Nation's power is derived from interaction of all factors [Squadron Officer School, 1983:32]."

Instruments of national power, the tools, techniques, or devices that are used to translate power, are employed in efforts to achieve national objectives (Cason, 1983:44). The military instrument of power is normally employed in the international arena (Snow, 1983:25).

Stoessinger states "Power in international relations is the capacity of a nation to use its, tangible and intangible resources in such a way as to affect the behavior of other nations [1982:28]." Although the military is but one element of national power, it performs a critical role in ensuring national security. United States leaders have consistently stated our determination to maintain sufficient military power to deter threats (AFM 1-1, 1979:p.1-2). The Department of Defense (DOD) maintains military forces to sustain that deterrence capability and

. . . to maintain and demonstrate the capability and resolve to counter any potential adversary, thus reducing the probability of hostile actions that threaten the security of the United States [AFM 1-1, 1979:p.1-6].

The Air Force and Deterrence

AFM 1-1 states:

The mission of the United States Air Force is to prepare our forces to fight to preserve the security and freedom of the people of the United States. Our goal is peace. To achieve this goal we must deter conflict by maintaining a force that is capable and ready [1979:V].

Regarding deterrence, AFM 1-1 states:

Deterrence results from a state of mind brought about by perceived military power that presents an unacceptable risk to any nation planning hostile action. Deterrence exists in the minds of individuals. It stems from the perception by other nations of our capability, intent, and will.

Deterrence is sustained through two triad systems: the theater defense triad is made up of three forces that are mutually supporting-conventional, theater nuclear, and strategic triad forces. The strategic triad has three nuclear force components that are also mutually supporting-intercontinental ballistic missiles, submarine-launched ballistic missiles, and manned bomber aircraft [1979:p.1-7].

The intercontinental ballistic missiles (ICBMs) are an important component of our deterrent force and will so remain well into the future (Gray, 1982:81, Schneider, 1980:55). It is an essential part of our deterrent capability and has unique qualities (Gabriel, 1983:72). Gray lists the following when describing the ICBM force:

It is the most accurate means for striking promptly at time-urgent targets.
It has uniquely reliable C.³ (see note 1)

¹C³ is command, control, and communications and refers to "the systems and procedures used to insure that the President, senior civilian and military officials, and U.S. strategic nuclear forces remain in communication with each other, able to plan for the use of nuclear weapons, to

It is always "on station" (that is, it has a very high operational readiness).

To date, at least, it can be threatened only by a very large strike against American soil (which should be a uniquely deterring prospect).

It enjoys a preeminence of respect in Soviet eyes (witness Soviet practice).

It provides cover, through attack-timing complications, for manned bomber/cruise missile carrier force.

It diversifies the threat faced by the Soviets.

The ICBM is the counterforce weapon par excellence [1981:39].

The current ICBM systems maintained by the Air Force consist of 48 LGM-25C (Titan II), 450 LGM-30F (Minuteman II), and 550 LGM-30G (Minuteman III) missiles (Strategic Missiles, 1983:158). The Titan II missiles are two stage, liquid fueled, and expensive to maintain. They are of decreasing value to the overall U.S. strategic posture and are being phased out of the inventory (Strategic Missiles, 1983:158). The Minuteman II and III are three stage, solid-propellant missiles smaller and lighter than the Titan II. The Minuteman III has a three warhead nuclear weapon capacity while the Minuteman II has a single nuclear warhead capacity. The Minuteman III also has a command data buffer (CDB) system that permits prompt retargeting actions. These systems are maintained to support the Single Integrated Optional Plan (SIOP): "The preplanned

choose among options, to deliver orders to the forces in the field, and to receive word that the forces have executed or attempted to execute their wartime operations [MX Missile Basing, 1981:332]."³ C³ is an important component of deterrent potential (Taylor, 1981:A17).

nuclear attack options prepared for the consideration of the President by the Department of Defense [MX Missile Basing, 1981:334]." Strategic Air Command Regulation (SACR) 66-12, Volume I, ICBM Maintenance Management Policy and Supervisory Responsibilities, states: "All maintenance actions and all management's efforts must be dedicated to support of the SIOP. A high alert rate is required [1981: p.1-4]."

Maintenance actions are conducted as part of the logistical process. Air Force Manual (AFM) 400-2, Air Force Logistics Doctrine, states: "Logistics is the link between the national economy and the overall military capability [1968:p.4-1]." AFM 400-2 lists the four major areas under which logistics tasks fall:

1. The Requirements Determination Function--identifies the resources needed to accomplish assigned missions.
2. The Acquisition Function--the obtaining of that which is needed.
3. The Distribution Function--the providing of that which is needed to those who need it.
4. The Maintenance Function--the continued support of that which has been acquired and distributed [1968: p.4-1].

Maintenance has been defined as "the upkeep of equipment to prolong its usefulness as much as possible [Huston, 1966: vii]." AFM 400-2 states "It includes inspection, testing, servicing, classification as to serviceability, repair, modification, and reclamation [1968:p.4-6]." Maintenance accounts for a large portion of the defense budget: costs

are estimated in excess of \$5 billion (Kane, 1981:20).

Grimard states:

The management of maintenance is a huge, inter-related, interactive and expensive process. The performance of this management system, however, is obviously a crucial determinant in our war-fighting capability [1980:279].

To insure efficient and effective management, Air Force Logistics Command (AFLC) provides centralized surveillance of the maintenance effort (Grimard, 1980:282). It is involved in the development and application of maintenance concepts and practices throughout the life of a weapon system; interacting with the operational command responsible for the weapon system (Folkeson). Strategic Air Command (SAC) is responsible for maintaining the Minuteman Missile Force. SAC performs the maintenance according to prescribed policies and procedures. AFR 66-14, Equipment Maintenance Policies, Objectives, and Responsibilities, sets up principles to be used in developing maintenance concepts (1978:1). SACR 66-12, Volume I, states:

The maintenance management system is designed to provide optimum maintenance performance within the constraints of reasonable cost, maximum efficiency, and security [1981:p.1-1].

According to AFR 66-14, the main goal of the equipment maintenance program is systems and equipment ready to perform their missions at the least cost to the government (1978:2). The product of maintenance management must remain mission oriented.

Toward this end, maintenance is composed of two elements: a technical element, maintenance engineering; and a production element, maintenance production. The technical element involves maintenance concepts and equipment designs compatible with desired levels of reliability and maintainability. Reliability is the characteristic or the probability of a system, subsystem, component, or part to perform a required function given specified conditions (McCann et al., 1981:576). Maintainability is:

A characteristic of design and installation expressed as the probability that an item will be restored to a specified condition within a given period of time when the maintenance is performed using prescribed procedures and resources. System maintainability may also be expressed in such terms as Mean-Time-to-Repair . . . or Mean Down-Time [McCann, 1981: 406].

Maintenance production concerns the performance of technical maintenance tasks in the most efficient and effective manner, collection of performance data on personnel and equipment for use by management, and suggesting improvements in both management procedures and equipment design based on field experience.

Maintenance Personnel

AFR 66-1, Equipment Maintenance: Maintenance Management Policy, states that "the key to successful maintenance production is a stable, weapon system-experienced, maintenance workforce [1983:p.2-3]." Consistent with the mission orientation, and the needs of the production

element, programs are established to aid the selection, education, training, career development, and retention of qualified personnel for assignment to maintenance organizations (AFR 66-14, 1978:3). "Training programs are created to provide an Air Force maintenance capability that can keep pace with changing skill requirements [AFR 66-14, 1978:3]."

AFM 1-1 states:

The Air Force is composed of four basic elements: people; weapon systems; the facilities necessary for us to function and accomplish our roles and missions; and the organizational structure necessary to sustain the people, systems, and facilities. These elements are integrated to form a military force.

The most important element of the aerospace force is people [AFM 1-1, 1979:p.3-5].

According to AFM 1-1, the enlisted personnel who perform maintenance tasks on the ICBMs receive training in three general categories: military, technical, and professional military education (PME) (1979:p.4-10). Military training provides a transition from the civilian to the military way of life, while technical training moves people to higher skill levels providing the basis to advance to positions of greater responsibility (1979:p.4-7). PME covers many aspects of the military profession. (It is discussed later in conjunction with the enlisted force organization and fully described in Chapter III.)

A skill level is the degree of competence an individual has achieved with respect to the duties and responsibilities associated with an occupation or specialty

(Hiatt & Nunnery, 1981:10). The Air Force designates functional work areas by an Air Force Specialty Code (AFSC). The AFSC is a five-digit number to indicate a particular career field in the first three numbers and skill level in the last two numbers. Suffix and prefix designators may be assigned to specify either work on particular systems or unique job experience. The skill levels are related to grades, enlisted ranks, as indicated in Table 1-1.

TABLE 1-1
AIR FORCE GRADES PER SKILL LEVEL
(The USAF Personnel Plan, 1975:2)

Skill Level	Grade	Duty
1	E-1	Trainee
3	E-2/E-3	Apprentice
5	E-4/E-5	J Journeyman
7	E-6/E-7	Supervisor/Technician
9	E-8	Superintendent
CEM	E-9	Manager

The relationship between skill levels and grades stems from the requirements to achieve a certain skill level before being eligible for promotion to the associated grade [Hiatt & Nunnery, 1981:16].

Advancement through the skill levels is accomplished through formal technical training, on the job training (OJT), and completion of Career Development Courses (CDCs). A CDC is a formal system of "take home" study material

designed for specific skill levels within a career field. Completion of the required training and testing over the specified time results in individual upgrading to a higher skill level. The skill level and grade relationship forms the enlisted force organization.

The Enlisted Force Organization

AFR 39-6M, The Enlisted Force Organization, states the purpose of a formal enlisted force organization is to define specific responsibilities of each enlisted grade; relationships between grades; how each fits into the whole organization; and career progression through the enlisted grades (1977:p.1-1). Although the enlisted force is commonly thought to consist of two general categories of personnel, noncommissioned officers (NCOs) and airmen, the distinct and separate grades are grouped into three tiers. The following description has been taken from AFR 39-6M.

The first tier, Trainee-Apprentice, includes ranks of Airman Basic (E-1), a full time trainee; Airman (E-2), a trainee expected to understand and conform to military standards; Airman First Class (E-3), involved with technical training or on-the-job mastering of skills required of a specific career field; and Senior Airman (E-4), a transition phase from trainee apprentice to NCO. The Senior Airman gains knowledge of NCO responsibilities and

develops supervisory and leadership skills through PME² and job experiences. An Airman's performance report includes specific sections requiring evaluation of job performance, human relation abilities, learning ability, self-improvement efforts, adaptability to military life, bearing, and behavior (AFR 39-62, 1981:p.4-5). A Senior Airman is expected to present the image of competence, integrity, and pride and assert a positive influence on other Airmen.

The second tier, Technician-Supervisor, includes Sergeant (E-4), Staff Sergeant (E-5), and Technical Sergeant (E-6). The inclusion of the E-4 grade in the lower and middle tier is significant in that the transition from the rank of Senior Airman to Sergeant occurs within this grade. The Sergeant is considered a skilled NCO technician and assumes a working leader role. Development of supervisory skills is pursued in PME and job experiences to prepare individuals in this grade to assume increased leadership responsibilities. The development of NCO status is identified with increased emphasis on the concept of duty above friendship and personal desires. The Staff Sergeant is a working leader responsible for subordinates and for

²AFR 50-39, Noncommissioned Officer Professional Military Education and Civilian Initial Supervisory Training, describes the NCO PME as a five-phased program that prepares Air Force NCOs for positions of responsibility by broadening their leadership and management skills and by expanding their perspective of the military profession (1981:p.1-1). The NCO PME is more fully discussed in Chapter III.

effective accomplishment of assigned tasks; ensuring proper utilization of personnel and materials; identifying work to be performed; and participating in work accomplishment. Individuals achieving this grade are expected to develop abilities to critically evaluate the quality of work performed and service rendered while continuing to develop as technicians and supervisors. The Technical Sergeant, by definition, is qualified to perform highly complex technical duties in addition to providing responsible leadership in supervisory positions. Further, the Technical Sergeant is responsible for development of all enlisted personnel supervised and is charged to further his professional expertise and supervisory techniques. Performance reports for individuals in this middle tier include additional sections on supervision and acceptance of NCO responsibility (AFR 39-62, 1981:p.4-5).

The top tier, Supervisor-Manager, includes the top three enlisted grades; Master Sergeant (E-7), Senior Master Sergeant (E-8), and Chief Master Sergeant (E-9). The entry into this third tier, Master Sergeant, carries increased responsibilities and requires a broader managerial perspective. Jobs in this grade are primarily supervisory in nature as individuals prepare for advanced management positions. The Senior Master Sergeant is a supervisor-manager while the Chief Master Sergeant is the senior enlisted resource manager charged with effectively

applying resources toward accomplishment of the mission. Individuals in this top grade are expected to be thoroughly trained in technical aspects yet are not to be considered supergrade technicians. They may fill any management level position not prohibited by directives or law. Those members achieving these ranks are also evaluated on executive ability--judgement, decisiveness, communication ability, supervising, and leading (AFR 39-62, 1981:p.4-5).

This general description only gives the typical types of responsibilities for each grade and is not intended to imply that a great deal of overlap does not exist. In practice, an individual may be involved with activities normally assigned to two or three grades higher if he or she has evidenced an ability and desire for increased responsibilities.

The Technician to Supervisor Transition

The promotion system is designed to use the enlisted expertise in jobs increasingly oriented toward supervision and management. Although this system does provide supervisory training for technicians as they participate in PME, it does not provide alternatives to transitioning from technician to supervisor. Becoming a good technician will eventually lead to a promotion out of technically-oriented jobs. Most organizations do promote people to the supervisory level because they have

demonstrated considerable technical expertise in their line-level jobs (Mangrum, 1978:7). However, in the Air Force this policy drains the organization of its most capable technicians. "Organizations continually lose their best technicians to management jobs [Dilla]."

Both technicians and supervisors are of value and are needed by the Air Force. In a research effort dealing with the forced move from technician to supervisor, Chapin and Suarez concluded:

Highly trained technicians are an extremely costly and important resource to the Air Force. The statistical research conducted in this thesis demonstrated a problem in retention of career enlisted individuals in technical fields. Air Force long-range planning shows an increased demand for technicians by civilian sources during the eighties. Air Force studies also foresee a diminishing pool of individuals of military age. Technology is expected to become more complex during the next decade. The combined impact of these events clearly indicates the importance of retaining every technician trained by the Air Force. While the Air Force can't influence demographics or outside demand for technicians, it can influence such factors as its own career progression policies. Assuming that some technicians don't want to be managers, the present career progression system may be driving some valuable technicians away. It is also promoting technicians into supervisory and managerial positions, resulting in the loss of their service as technicians [1981:110].

The supervisor position is key to organizational effectiveness. These positions maintain a steady flow of information in both directions, management to line and line to management, and provide linkage necessary to attainment of organizational goals (Mangrum, 1978:13). Pierce and Robeson cite a contemporary management text which

acknowledges individual differences in the following manner:

Some employees don't want to be promoted. . . . Some employees refuse to be promoted to a supervisory status, because they find they cannot be responsible for what others do, . . . or because they know their limitations and recognize that they would probably fall on a more demanding job [1980:12].

The comments obtained by Pierce and Robeson indicate serious concern on the part of the enlisted members. Some of their comments were:

I know the need for supervision on a job is mandatory to get the best results; however, if a man/woman really doesn't want the responsibility he/she will hurt the people under them more than help.

Persons who have the desire to be supervisors would be a more successful supervisor, than a person who is forced into it.

We can't keep good people anymore and a lot of it is because we have too many unqualified supervisors trying to oversupervise too few mechanics (technicians).

To put me behind a desk is worthless; the Air Force will lose my technical skill and gain a belligerent supervisor [1980:78-79].

They concluded that, although the importance of both technicians and supervisors is recognized, supervisors are more highly regarded; respondents felt lower value is accorded those who are not promoted; some believed that there should be a choice regarding transition to supervisory positions, other than not getting promoted; and some believed that those in supervisory positions will have difficulty maintaining technical proficiency (1980: 83-85).

Problem Statement

Minuteman missile maintenance enlisted personnel progress through the Air Force promotion system. They move from technically oriented work to supervisory positions. A review of the recent research efforts regarding this transition indicates a problem exists. However, there has not been an attempt to determine the extent of this problem relative to the spectrum of issues impacting maintenance production.

Historically, research in Air Force maintenance has studied singular issues. For instance, many organizations have engaged in research in technical orders, maintenance training, and personnel selection over the last 10-15 years. But we have never established the priority of these single issues in the total scheme of maintenance problems. Although substantial progress has been made in some areas, such as job performance aids, it is impossible to state how much these improvements have increased the combat effectiveness and overall performance of maintenance organizations. Research in Air Force maintenance has not taken a broad enough look at the environment to understand where the most severe problems are and which have the highest probability of success in being solved [Campbell & Chenzoff, 1982:2].

Kane (1981:20) states that Air Force research into issues related to maintenance performance has been isolated, piecemeal, and continues to identify the same problems. He cites Foley's efforts to improve technical data, stating that Foley pointed out

. . . by addressing only the technical data issue and ignoring the concomitant issues of selection, training, promotion, and complex technology, more problems are created than solved.

The maintenance personnel, the promotion system, and the Minuteman weapon system are interrelated. The problems that exist in Minuteman maintenance are part of a system.

A system can be defined as:

. . . a set of objects together with relationships between objects and between their attributes connected or related to each other and to their environment in such a manner as to form an entirety or whole.

. Objects are the components of a system. . . objects are: the input(s), the process(es), the output(s), and the feedback control.

. Attributes are properties of objects and of relationships.

. Each system has something internal and something external to it. What is external to the system can pertain but to its environment and not to the system itself. However the environment of a system includes not only that which lies outside the system's complete control but that which at the same time also determines in some way the system's performance [Schoderbek et al., 1980:12-22].

Maintenance organizations are complex systems.

Maintenance personnel can be viewed as human inputs involved with maintenance processes in an effort to sustain maintenance production. The promotion system is also a process that impacts the personnel and the transition from technician to supervisor is an attribute of the promotion system and maintenance production. A need exists to determine the scope of this problem within missile maintenance organizations.

Research Objectives

The main objective of this research is to determine the scope of the technician to supervisor transition problem within the spectrum of problems that impact missile maintenance production. There are three lesser objectives that must be accomplished to realize the main objective:

1. To identify the spectrum of problems facing missile maintenance.
2. To identify any relationship of these problems to the technician-supervisor transition.
3. To identify the relative importance of the technician-supervisor issues in the problem spectrum.

Research Questions

To achieve the research objectives, the following specific research questions must be answered:

1. What are the problems in missile maintenance?
2. Which of these problems are related to the technician to supervisor transition?
3. How significant are these problems relative to all maintenance problems that have been identified?

CHAPTER II

MISSILE MAINTENANCE ENVIRONMENT

Introduction

Most missile maintenance airmen and NCOs are assigned to wing organizations. To understand the problems and work environment it is necessary to understand the organizational structure, unit task assignments, and unique dispatching requirements.

In Minuteman Wings, the Deputy Commander for Maintenance (DCM) manages the maintenance complex and is tasked with responsibilities to plan, schedule, control, and direct the use of all maintenance resources to meet mission requirements (SACR 66-12, Vol.1, 1981:p.2-1). The DCM uses staff and production activities to insure the performance of these assigned responsibilities (SACR 66-12, Vol.1, 1981:p.2-1). The DCM staff is made up of the following divisions: Maintenance Support, Maintenance Control, Training Control, and Quality Control. Maintenance squadrons are responsible for the actual maintenance performed on ICBMs and their support equipment. They are the Field Missile Maintenance (FMMS) and Organizational Missile Maintenance (OMMS) Squadrons. Charts for these organizations are contained in Figures 2-1, 2-2, and 2-3. The following

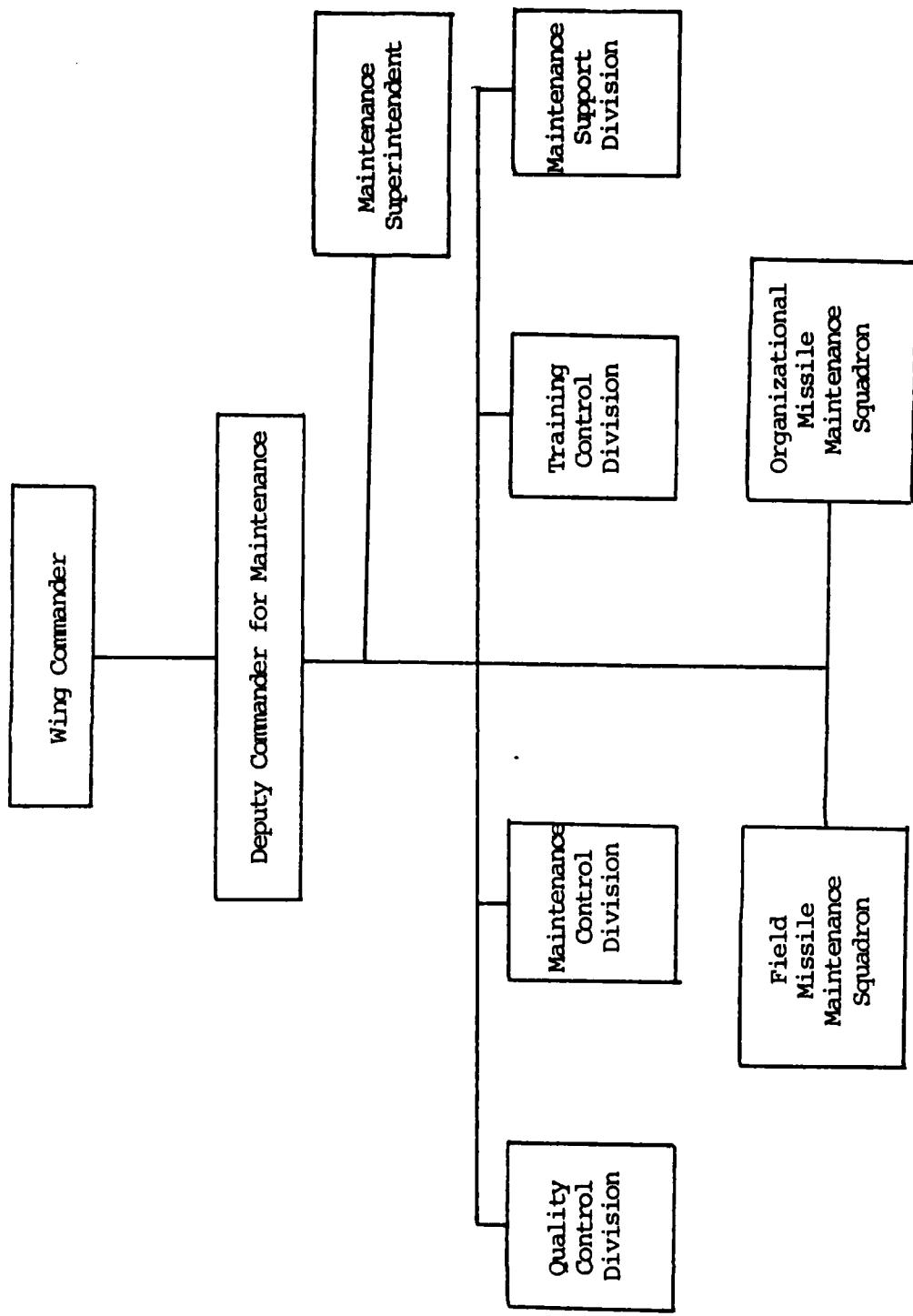


Fig. 2-1. Minuteman Wing Maintenance Organization

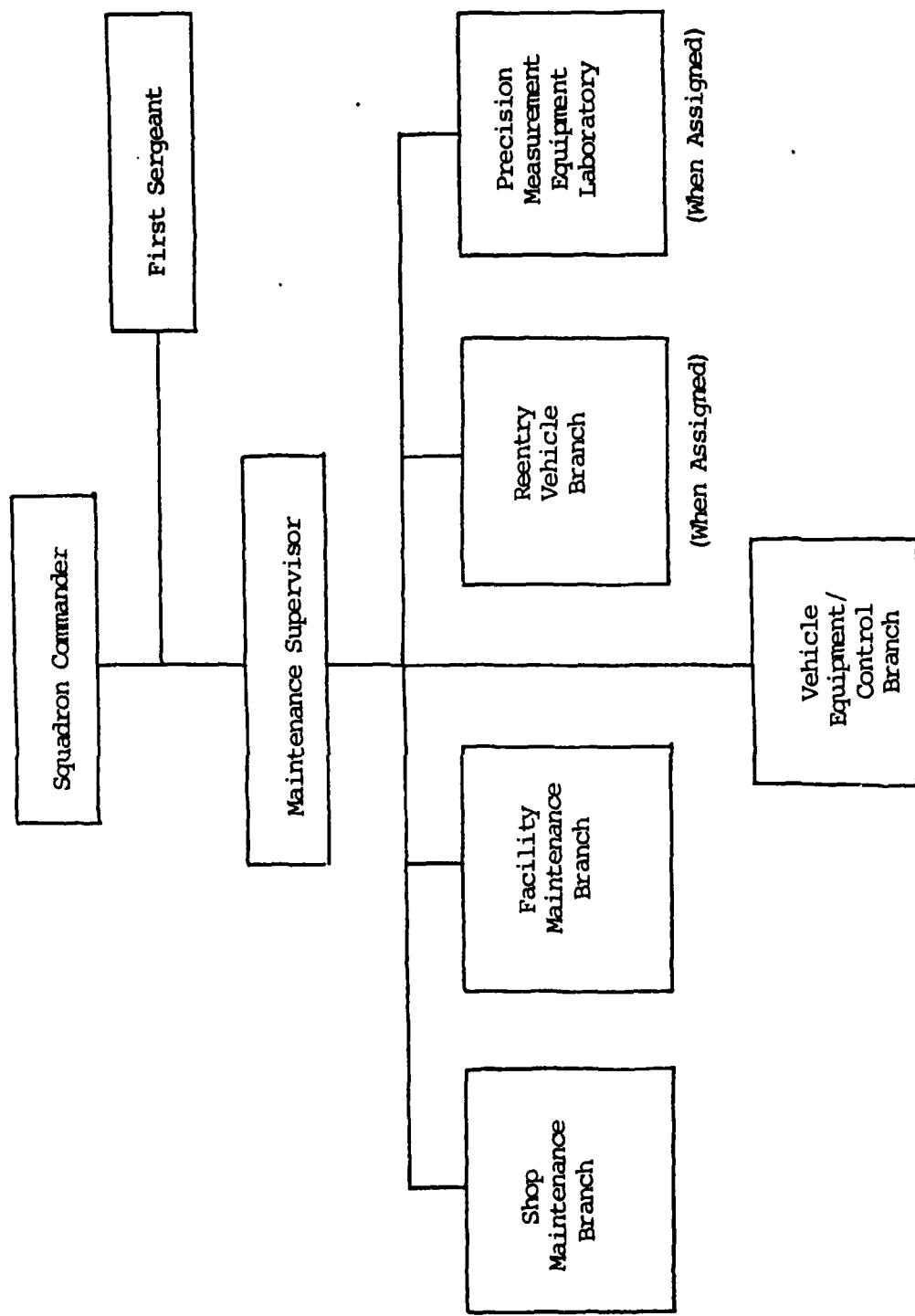


Fig. 2-2. Field Missile Maintenance Squadron

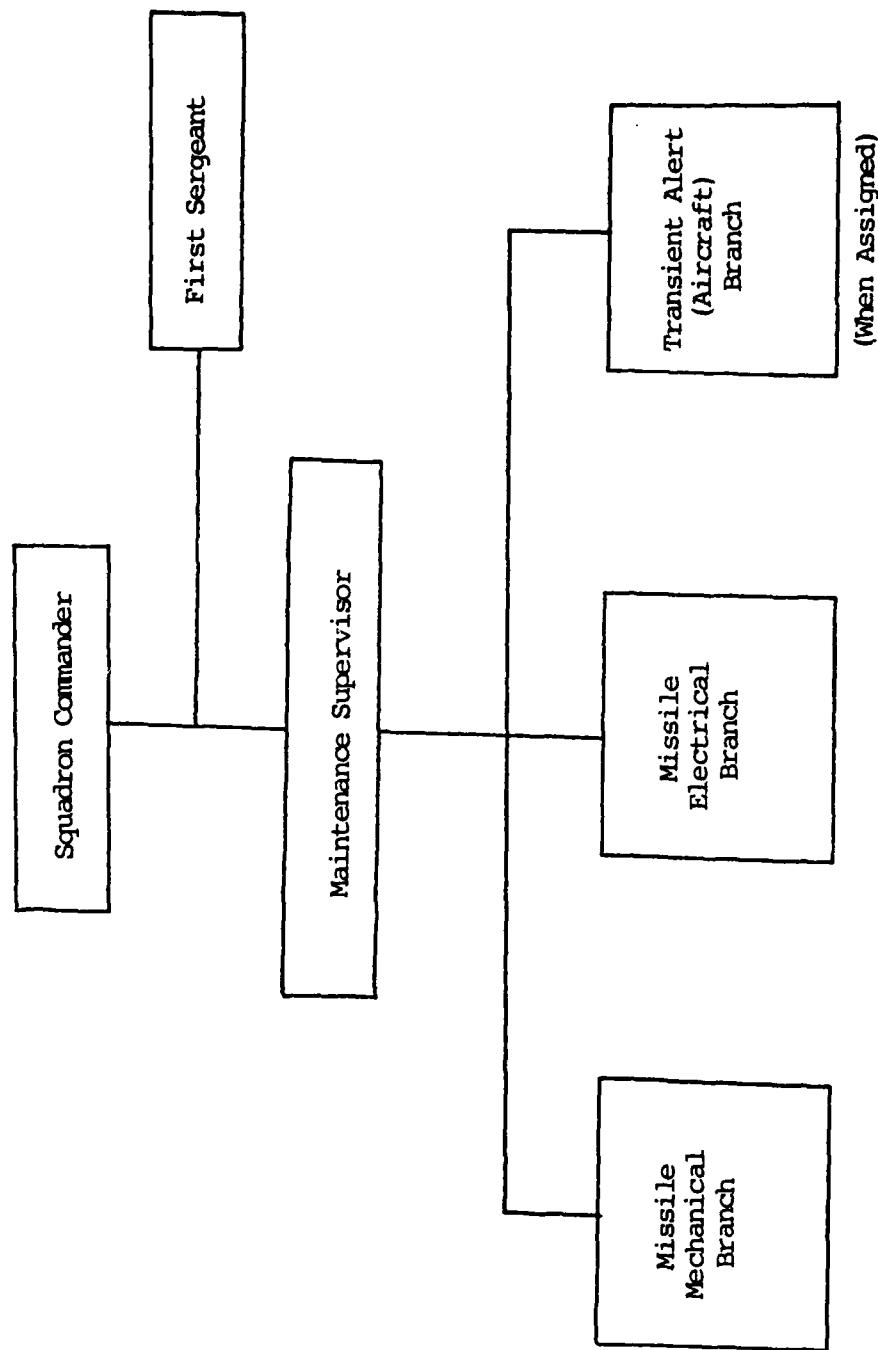


Fig. 2-3. Organizational Missile Maintenance Squadron

description of organizational structure has been taken from SACR 66-12, Volumes 1 through 6.

Maintenance Support Division

The Maintenance Support Division consists of Maintenance Administration, Maintenance Data, Maintenance Analysis, Maintenance Programs, and Technical Engineering. The purpose of the division is to provide administrative support for the DCM; analysis and advice on the management of logistics budgets, facilities, and manpower requirements; and weapon system expertise on system malfunctions.

Maintenance Control Division

The Maintenance Control Division consists of Scheduling Control, Job Control, and Materiel Control. Maintenance Control provides the centralized control over maintenance production activities. Job Control directs and controls the use of maintenance resources, primarily the activities of teams dispatched to the field and to activities on-base. Their actions are geared toward missile readiness, "on alert," through direction and support of teams in the field. Materiel Control provides coordination between maintenance and supply and works the supply system to obtain required item support. Scheduling Control determines personnel availability and prepares daily, weekly, and monthly action plans.

Training Control Division

Training Control is divided into the Team Training Branch and the Training Management Branch. Unlike most other Air Force units, the Team Training Branch (TTB) conducts the majority of skill upgrade training instead of it being done by an OJT administrator who works with supervisors. Training areas include: general training (safety, security, cold weather indoctrination, corrosion control, and initial military driver training), upgrade training, job qualification training, maintenance training, recurring training, and special technical training. The TTB is geared toward developing effective and well-coordinated teams. The Training Management Branch monitors, schedules, and controls upgrade training, job qualification training, management training, general training, recurring technical, and special technical training programs.

Quality Control Division

The Quality Control Division ensures an effective maintenance operation by evaluation and inspection of personnel, procedures, equipment, facilities, and technical data. Quality Control advises the DCM on technical matters and assures compliance with technical and management procedures. This is done through implementation of the Maintenance Standardization and Evaluation Program (MSEP), and

the technical, activity, and special inspections. Quality Control also serves the maintenance teams as another source of weapon system expertise.

Missile Maintenance Squadrons

The maintenance teams belong to the two main-maintenance squadrons, OMMS and FMMS. The various squadron sections interact daily with each other and the units already described. The Squadron commanders must maintain adequate production levels in addition to carrying out duties typical of nonmaintenance organizations. The Maintenance Supervisor is directly involved with the management of assigned resources to achieve required maintenance production. Branch Chiefs are responsible to the Maintenance Supervisor for the management of specific functional specialty areas. The majority of the enlisted personnel involved in maintenance production are assigned to the various squadron branches.

FMMS is made up of the Shop Maintenance, Facility Maintenance, and the Vehicle and Equipment Control Branches. FMMS in missile wings not located on-base with a bomb wing also contain a Precision Measurement Equipment Laboratory (PMEL) and a Reentry Vehicle Branch to support the missile maintenance activities. When colocated with bomb wings, these two units will be assigned to the adjacent aircraft squadrons.

The Shop Maintenance Branch is composed of Power-Refrigeration-Electric (PREL) and Mechanical (MECH) Shops, and the Electronics Laboratory at most wings. The work in these shops includes repair of support equipment, special vehicle requirements, and maintenance of electronic system components.

The Facility Maintenance Branch contains the Pneudraulics, Facilities Maintenance Teams, Corrosion Control, and Periodic Maintenance Sections. Individuals in these shops maintain hydraulic and pneumatic systems, site support equipment and test equipment. Periodic maintenance personnel perform recurring periodic maintenance tasks.

The Vehicle and Equipment Control Branch (VECB) provides serviceable vehicles and equipment for use in performing maintenance at Launch Facilities (LFs) and Launch Control Facilities (LCFs). This branch consists of Vehicle Control, Equipment Control, and Equipment Recovery sections.

PMEL, whether under FMMS or the associated bomb wing, provides maintenance, calibration, and certification of specified test equipment. The Reentry Vehicle Branch provides maintenance of the reentry vehicles and associated test and handling equipment.

The OMMS consists of a Missile Mechanical Branch, a Missile Electrical Branch and, when not colocated with a bomb wing, a Transient Alert Branch.

The Missile Mechanical Branch has Missile Maintenance Team and Missile Handling Team sections. This branch is responsible to transport, install, and remove missiles, reentry vehicles, reentry systems, propulsion system rocket engines, and emergency rocket communications systems. It also has a penetration aids section.

The Missile Electrical Branch consists of the Electro-Mechanical Team (EMT). The EMT is responsible for repair of electronic, electrical, surveillance, and access systems.

The Transient Aircraft Branch, when assigned, provides for the servicing and ground handling of transient aircraft.

Minuteman Missile Maintenance Dispatches

The physical layout and security procedures of the Minuteman weapon system creates unique dispatching requirements. The sites in Minuteman wings consist of ten LFs grouped around an LCF. These clusters are interconnected electronically into squadrons of fifty LFs to five launch control centers (LCCs) located below ground at the LCFs. A wing will have three or four squadrons dispersed around a support base. The distances vary from zero to over 100

miles from the base, and this accounts for many of the unique aspects of missile maintenance. Teams are dispatched from the home base to these sites to perform many of the maintenance tasks. They normally travel from the base to the field facilities by pickup truck. The majority of the Minuteman bases are in the northern portion of the United States and susceptible to severe weather conditions which impact on maintenance capabilities. The determination of what type of maintenance is required can often become quite complex. The initial identification of equipment faults normally comes from the missile launch crews who are on continuous duty in the LCCs. Communication between the maintenance team, the launch crew, and job control is often difficult due to distances and communication equipment malfunction.

When on site, a team chief, the leader of a team consisting of two or more individuals, normally coordinates activities with the LCC having responsibility for the LF. Depending on squadron LCC functional status, different LCCs may have responsibility for a site. This is another variable which can complicate communication. The capsule crew at the appropriate LCC will interface with the maintenance team, the wing command post, and job control on a regular basis. When difficult problems are encountered, it is not abnormal for a capsule crew to work with a number

dispatched from the LCF to the particular LF to insure all is in order. During site entry, formidable mechanical barriers must be passed for the team to gain access to the below ground facilities. If a team can gain entry to the missile support equipment racks in the launcher in one hour it is doing well. After this penetration is completed a lot of equipment must be set up before actual maintenance work can begin. By this time the team may have been on duty for six hours and still not begun the actual maintenance task.

Once the maintenance work is completed, the team will basically go through all pre-maintenance tasks in the reverse order. These back-out and return to base times are usually shorter in length and can be estimated at about five hours. Job control tracks the maintenance teams on a closely monitored timeline. The teams are not, in normal circumstances, allowed to exceed sixteen hours on a dispatch. Therefore, only about five hours may be available for actual maintenance during a long day. Teams which do approach the time limit may have to RON, to complete maintenance actions the next day. However, it is generally more desirable for the team to return to the support base at the completion of its maintenance activities and that is the usual routine.

The merging of the base agencies and available resources to accomplish the kinds of dispatches described

of base agencies coordinating actions for several maintenance teams working on sites the crew is monitoring.

Site security is critical. The maintenance teams, in most cases, are accompanied by security personnel. However, the team chief is responsible for all activities at the site, including security checks with the LCC. When more than one team is on site, the compliance with appropriate site exit and entry procedures can require extensive coordination.

A typical workshift begins with the team members reporting for duty before the sun rises. First, the team members must take care of predispatch activities. These consist of vehicle and equipment checkout and various briefings. Special care must be taken to insure that all gear is loaded for the specified tasks because the maintenance to be performed will be too far from the support base to permit return for forgotten tools. The drive to the missile site may be as long as two hours in favorable weather. In unfavorable weather the trip might consume the time available for maintenance thus requiring the team to either return to the base or remain at an LCF overnight (RON). When the team arrives at the site, it must contact the missile combat crew through the security personnel at the appropriate LCF. A small mistake by any member during entry procedures may result in security personnel "striking" the site. This means that security forces will be

requires extensive coordination and scheduling. A team must be assembled with the right equipment, people, and security clearances at the right time and place to accomplish the desired end: a high state of readiness of the Minuteman force. These teams are drawn from the maintenance shops as required. Team members typically rank from Airman First Class to Technical Sergeant. Supervisors are responsible for the actions of teams from their units. The enlisted maintenance personnel carry out their responsibilities in this unique environment. The system is complex and highly structured, yet it must allow for a great amount of flexibility in response to maintenance requirements.

The impact of the move from technician to supervisor within this particular setting has not been formally evaluated. The requirement for highly qualified technicians to maintain the ICBM systems is not debatable. The equipment is the most advanced in the world. The responsibilities of these young men and women require them to be knowledgeable and to apply sound judgement in the field. The supervision of their activities is not an easy task nor can it be accomplished by individuals who do not understand the problems likely to be encountered by the teams in the field.

CHAPTER III

NCO PROFESSIONAL MILITARY EDUCATION

Introduction

The Air Force prepares enlisted personnel for supervisory roles through informal on-the-job training and formal training in the classroom setting. Professional Military Education is a specific curriculum used by the Air Force in training its members in a variety of areas. AFR 50-39 states that Professional Military Education is:

. . . a five-phase program that prepares Air Force NCOs for positions of responsibility by broadening their leadership and management skills and by expanding their perspective of the military profession.

This program meets a vital Air Force need and is designed to meet individuals' needs at particular times in their career [1981:p.1-1].

The NCO PME is divided into different phases offered at progressive steps in an NCO's career. The program consists of: Phase I--NCO Orientation Course; Phase II--USAF Supervisors Course; Phase III--NCO Leadership School; Phase IV--NCO Academy; and Phase V--Senior NCO Academy. AFR 50-39 gives the following basic outline of these phases.

Phase I--NCO Orientation Course

The purpose of this course is to introduce newly promoted E-4 Senior Airmen to the duties and responsibilities

of NCOs. The course is taught locally (at the individual's base of assignment), is scheduled for 21.5 hours, and includes the following areas: leadership, management, and the USAF profession.

The leadership area includes units on human behavior and NCO roles and responsibilities. The concepts covered in the first unit deal with the causes and sources of human behavior and their impact on personal and professional relationships. The second unit covers communication, counseling, discipline, leadership, the military justice system, and specific NCO responsibilities.

The management section covers the functions in the management process that help in accomplishing mission requirements. It also covers the purpose, use, and impact of the Airman Performance Report (APR).

The section on the USAF profession consists of material on Air Force organization and mission, Air Force programs and policies, career planning and progression, and wear of the uniform.

Phase II--USAF Supervisors Course

This course is designed to provide E-4 Sergeants, E-5s, and civilian supervisors with the leadership and management skills required to successfully perform their first supervisory duties. The course is also taught locally and is scheduled for twenty-eight hours of instruction. The

four general areas covered are the same as those in Phase I. However, the units vary in content.

The leadership area includes a section on human behavior. This section covers: individual behavior (with an emphasis on interacting more effectively with people), values (their impact on human relations and effective leadership), interpersonal requirements (with discussion of self-concept and subordinate perceptions), and group behavior (the dynamics that impact behavior). The second leadership section covers interpersonal communication (such as listening, retention, and nonverbal communication) and effective reading, writing, and speaking (emphasizing the importance of organizing thoughts and ideas). The leadership section presents leadership principles related to: counseling (covering directive, nondirective and eclectic methods), discipline (the effects of positive discipline as an essential element in effective mission accomplishment), problem solving (presenting systematic approaches), and effective leadership (with discussion of leader and follower styles and situational influences).

The management area consists of one unit on labor relations and one on management principles and theory. The labor relations unit covers the importance of establishing and maintaining cohesive relationships between management and labor in order to accomplish the Air Force mission. Management principles and theory covers how

managerial theories relate to effective leadership, performance standards, and training (the value of ensuring proper procedures, training, and evaluation of subordinates). This section also relates managerial theory to the supervisor's job (covering the nature and requirements of supervisory jobs and a discussion of the dynamic environment). This section also covers supervisory responsibilities as representatives of upper management. Lastly, it covers drug and alcohol abuse issues.

The USAF profession covers Air Force history (the significant events in the development of aviation), Air Force programs and policies (to enhance professionalism), career development (selected elements of career progression), and the total force policy. The total force policy includes, in addition to the regular force, the Air National Guard, the Air Force Reserve, and the civilian force. The relationship of these organizations to the Air Force mission is discussed. Wear of the uniform is covered in this section. It also includes a unit on the professional supervisor that discusses professionalism as an important part of the Air Force supervisor's responsibilities.

Phase III--NCO Leadership School

This course is designed to further develop leadership and management skills of selected NCOs in the grades of E-4 Sergeant and E-5. Leadership schools are run by

the Air Force major commands at selected bases. The NCOs attend the courses in a temporary duty status at well established schools and involve a much longer time period. The curriculum is scheduled for 143 hours of instruction in the following areas: military studies and activities, leadership and management, communicative skills, world affairs, and commandant selected topics.

The first area, military studies and activities, covers five units: the Air Force organization and mission, the military justice system, professional skills, customs and courtesies, and physical conditioning. In the first unit, students study the Department of Defense (DOD) organization and function of the Air Force, and the different types of Air Force organizations (major commands, special operating agencies, and direct reporting units). The military justice unit covers purpose, history, and sources of the United States military justice system. The professional skills unit emphasizes application of professional skills including personal appearance, wear of the uniform, drill, customs, and courtesies. It presents the proper protocol for Air Force functions and the military honors extended to civilian personnel and distinguished persons. It also covers the background and honors accorded the flag and the national anthem. The physical conditioning program is designed to apply physical skills in conditioning or sports programs.

The leadership and management area consists of units covering the role of the NCO as a leader, effective leadership, human behavior, standards and discipline, counseling, supervisor's job and responsibility, personnel evaluation, personnel management, and problem solving. The material covered in each of these areas is similar to Phases I and II but the coverage at Leadership School is much more extensive and allows for greater discussion and analysis of issues. The time allocated to these areas also allows further extensions of ideas into specific Air Force environments and incidents.

The unit on supervisor's job and responsibility is of specific interest in this research effort. Cohesive relationships, time management, job enrichment, management by objectives, work distribution, and methods improvement programs are among the main points covered. Also, the unit on personnel management emphasizes the execution function of managing, giving attention to inputs from advisory agencies (such as Management Engineering, Leadership and Management Development Center Consultant, Job Enrichment, and IG Staff Assistance Teams). It includes simulated work situations.

The fourth area, world affairs, has units covering the fundamentals of world politics, political ideologies, economic ideologies, international positions, and USAF basic doctrine. The first unit defines terms used in the

study of world affairs and national objectives. It covers determinants of national power, instruments of national policy, and relationships between national objectives, and the organization of the United Nations (UN). The political ideologies unit covers the evolution of democracy, its basic principles, its form (including checks and balances, judicial review, and the two party system), and individual roles and responsibilities in the democratic process. This unit also covers principles of communism such as economic determinism and concepts regarding a classless and godless society. The economic unit compares capitalistic, socialistic, and communistic systems. The last unit, international positions, covers the nature of third-world influences, communist influences, and international treaty organizations. This unit reviews USAF basic doctrine as presented in AFM 1-1.

The Commandant's time is used for guest speakers and administrative purposes.

Phase IV--NCO Academy

The objective of the Academy is to prepare selected E-6s and E-7s for more advanced leadership and management responsibilities. There are over 40 academies throughout the Air Force (Shiroyama, 1980:53). The course of study is allocated 216 hours. The curriculum consists of five major areas: military studies and activities, leadership

and management, communicative skills, world affairs, and commandant's time. The content of these areas is similar to that found in the NCO Leadership Schools. The emphasis in PME as an individual progresses through the various phases is toward increased comprehension and application. Only the areas not in the preceding NCO Leadership School outline are mentioned here.

In the leadership and management area, orienting new personnel and management theory are covered as specific units. The first emphasizes the importance of selecting a sponsor and the supervisor's role in orienting new personnel. The other covers classical/scientific and humanistic/behaviorist schools of management theory.

The world affairs area includes units on international positions, military conflict, and doctrine. The goal of the first unit is for each student to comprehend the impact of international positions of U.S. national interests through its coverage of the development and application of U.S. foreign policy and basic foreign policy objectives. It covers the objectives of the major regional arrangements, alliances, and agreements. The second unit is aimed at understanding the need for defensive and offensive forces capable of prompt and effective use to deter potential enemies or to react to serious threats to national security.

Phase V--USAF Senior NCO Academy

The purpose and principle of the USAF Senior NCO Academy is:

. . . to provide the education necessary for senior noncommissioned officers to become more effective and efficient leaders and managers during peacetime, time of crisis, and conflict. The graduates of this course should approach their assignments with an expanded perspective of the military progression, and with broadened leadership and managerial capabilities [AFR 50-39, 1981:p.A-16].

This is an eight-week course with three major areas that cover communication skills, environment, and management. Communication goals are to apply the principles of effective communication. The environment area includes two units: the USAF national security objectives and the USAF role in force application. These units cover factors that enter into international relations, the elements of national policy, and the employment of military force in achieving objectives over a broad range of circumstances. The Management area is geared toward applying concepts and techniques suitable for the effective management of material and human resources.

Conclusion

PME is the primary source of supervisory training for Airmen and NCOs. It covers a wide variety of areas to develop the skills necessary for successful completion of the USAF mission. It does this by expanding the NCO's

perspectives through presentation of issues of a much broader scope than normal enlisted jobs entail. It ties the individual's job to national objectives. It develops skills and abilities necessary for the efficient and effective performance of those jobs. It is this training in conjunction with the promotion system that moves the enlisted members from technically oriented work to supervisory positions.

CHAPTER IV

METHODOLOGY

Introduction

This chapter presents the methodology used in this research effort. It summarizes the key sections of a Maintenance Environment Improvement Analysis: Phase II--pretest report (Chenzoff & Joyce, 1982:1-28). This was a research effort by the Air Force Human Resources Laboratory (AF/HRL), Logistics and Technical Training Divisions, to identify factors that influence the technical, physical, and psychological environment within which Air Force maintenance is performed. Sections of the data generated by the AF/HRL study were selected for further analysis in answering the research questions addressed in Chapter I. The justification for selection of portions of the data gathered by AF/HRL is presented, and the methods of analysis are described. The procedures used during the data analysis are described.

Background to AF/HRL Study

The objective of the AF/HRL study was to obtain a deeper understanding of the factors that influence Air Force maintenance from the perspective of the persons most actively involved in order to build a long-range plan for

application of existing technology and guide further research (Chenzoff & Joyce, 1982:1). The primary method of data collection was structured interviews with selected maintenance personnel. The study consisted of six phases: two preparatory, three data collection, and one addressing what needs to be done about issues raised by the persons interviewed. For the purpose of this research, only the results of Phases I and II are described. These phases involved a literature review, development of data collection procedures and instruments, and testing of the data-collection and analysis instruments and procedures.

The AF/HRL study was exploratory in nature. It used methods to allow as much freedom in identification and development of maintenance problems as possible. The use of qualitative methodology allowed the greatest flexibility in developing a picture of the problems in the maintenance environment.

Quantitative measures are succinct, parsimonious, and easily aggregated for analysis; quantitative data are systematic, standardized, and easily presented in a short space. By contrast, the qualitative measures are larger, more detailed and variable in content; analysis is difficult because responses are neither systematic nor standardized. Yet the open-ended responses permit one to understand the world as seen by the respondents. The purpose of gathering responses to open-ended questions is to enable the researcher to understand and capture the points of view of other people without predetermining those points of view through prior selection of questionnaire categories (Patton, 1980:28).

Qualitative data are attractive for many reasons: they are rich, full, earthy, holistic, "real;" their face validity seems unimpeachable: they preserve chronological flow where that is important, and suffer minimally from retrospective distortion; and they, in principle, offer a far more precise way to assess causality in organizational affairs. . . [Miles, 1979: 590].

The first assumption of this research is that the people who do maintenance, supervise maintenance, manage maintenance, and plan maintenance are the ones who best know the problems in maintenance (Campbell & Chenzoff, 1982:2). This assumption is similar to the concept behind a popular movement known as Quality Circles.

Quality Circles

Quality Circles call for employee participation throughout the decision-making process. Quality Circles are oriented toward solving problems identified by employees. Adaptations of Quality Circles are found in many different types of organizations. An Army program called Work Environment Improvement Team (WEIT) is an application of Quality Circle concepts to that military environment to address organizational challenges and build group cohesiveness and teamwork (Konarik, 1982:10). An understanding of what Quality Circles are is important to understand how they rely on employee perceptions.

A Quality Circle is a small group of volunteers from the same work area who meet together on a regular basis to identify, analyze, and solve product quality and

other problems in their area (Terry, 1980:12). Quality Circles were started in Japan in the early 1960s to further improve the quality of domestic production (Patchin, 1982: 10). Before World War II, the world viewed Japanese products as low priced and poor quality: the label "made in Japan" was often translated as junk (Yager, 1979:682). To reverse this trend, the Union of Japanese Scientists and Engineers (JUSE) organized a quality control research group in 1949. In 1950, Dr. W. E. Deming, and in 1954, Dr. J. M. Juran, were invited to Japan to lecture and teach concepts of statistical quality control and the management of the quality control function. Their teaching contained a seed of quality control which later initiated the idea of Quality Circles. Japan needed further development of quality control methods. The Japanese had nearly a generation of training and national commitment to improved quality when Dr. Ishidawa and the JUSE developed the Quality Control Circles training materials. The training package was promoted among Japanese industries in 1962 (Patchin, 1982: 10). From that time to the mid seventies, Quality Circles have developed and become so widespread that most Japanese managers will tell you Quality Circles are a way of life in the typical Japanese plant.

W. S. Richer, formerly of Lockheed but now president of Quality Control Circles, has been credited with introducing Quality Circle concepts in the United States.

According to Richer, the key to Quality Circles is that people represent themselves (Yager, 1979:682). It is evident that workers have valuable insights into the work environment and that management should use these insights to help identify and solve problems.

Data Collection Instrument

The data for this study was obtained through open-ended interviews. The structure was only limited to questions which would initiate a discussion of maintenance problems or clarify an area brought up.

The purpose of providing the interview with structure is to ensure that all people interviewed respond to the questions the researcher wishes to have answered; however, the formulative and discovery functions of the experience survey require that the interview always allows the respondent to raise issues and questions the investigator has not previously considered [Sellitz et al., 1976:57].

The subjects were asked general questions (see item 7, Figure 4-1). Open-ended questions were used to reduce any effect of interview bias toward preconceived maintenance problems. For subjects who were unable to think of possible areas (estimated later to have been less than 10 per cent of the sample), a list of factors was presented as a prompting device for topics to explore (see Technician Needs List, Figure 4-2). The list was not presented as a guide of areas which needed to be discussed, but a prompting to stimulate the interviewee's thinking about components of the maintenance environment. The intention was to avoid

1. Introduce yourself and organization.
2. Briefly discuss project goals..
3. Stress confidentiality and voluntary participation.
4. Present Privacy Act Statement.
5. Collect Biographical data.
6. Ask what kind of work subject does.
7. Ask: What do you think could be done to improve missile maintenance?

What do you think could improve your work and attitude on the job?

What do you think is the best thing about this squadron? Air Force in general?

What are the most important things that could be done to improve Air Force maintenance?

What keeps you from doing your job well? What keeps your unit from being the best?

How do you feel about your job? Are you happy as a mechanic? Do you think the other people are happy?

We want you to talk about (from your perspective) what could be done to improve maintenance. What do you think is important to maintenance?

What's good about maintenance? What about it works well? What alternatives do we have to get better maintenance performance? Is there a way to improve the situation? Is there anything else that could improve maintenance?

8. Thank the subject.

Fig. 4-1. Interview Procedures with Sample Questions

TECHNICIAN NEEDS

TECHNICAL COMPETENCE	MOTIVATION	EQUIPMENT SUPPORT
<p>Self Experience</p> <p>Training – Tech School, OJT, FTD, CUT, CDC, PME</p> <p>Others</p> <p>Technicians</p> <p>Supervisors</p> <p>Officers</p>	<p>Job Satisfaction</p> <p>Job Status</p> <p>Job Involvement/Caring</p> <p>Identification With Unit</p> <p>Desire to do a Complete Job</p> <p>Patriotism</p> <p>Feedback</p> <p>Discipline/Conformity</p> <p>Off Duty Factors – Living Conditions, Housing, Recreation, Social Interactions</p>	<p>Hand Tools</p> <p>Test Equipment</p> <p>A.G.E.</p> <p>Automatic Test Equipment</p> <p>Special Tools</p> <p>Protective Clothing</p> <p>Spare Parts</p> <p>Bench Stock</p> <p>Prime Equipment</p>
METHODS SUPPORT	WORK ENVIRONMENT	PERSONNEL POLICY
<p>Troubleshooting Procedures</p> <p>T.O.s</p> <p>Inspection Work Cards</p> <p>MOIs</p> <p>Local Work Rules</p> <p>Regulations</p> <p>Forms Preparation</p> <p>Job Scheduling</p>	<p>Physical</p> <ul style="list-style-type: none"> • Cold/Heat • Lighting • Noise • Space/Facilities • Transportation <p>Psychological</p> <ul style="list-style-type: none"> • Supervision • Work Pressure <p>Organizational</p> <ul style="list-style-type: none"> • Job Structure • POMO/66-1 • Work Distractions/ Non-Maintenance Duties <p>Manpower Availability</p>	<p>Selection</p> <p>Promotion</p> <p>Assignment</p> <p>Retention</p> <p>Transfer</p> <p>Pay</p> <p>Benefits</p> <p>Enlisted Incentives</p>

Fig. 4-2. Technician Needs

directing the subjects into specific discussion areas and allow them to decide for themselves the important problems.

The interview method of data collection was used in a pre-pretest at Langley AFB. Twenty-nine individuals from the 1st Tactical Fighter Wing were interviewed. The following procedures were developed during the pre-pretest:

1. A less complex technician needs list was developed.
2. Determination to capture the data through note taking as opposed to tape recording.
3. Initial development of a categorization scheme.

Tape recorders were initially used in evaluating the effectiveness of note taking. There appeared to be little difference between the data tape recorded and the comments written in the interviewer's notes. Therefore, it was not judged necessary to use the tape recorder. The categorization scheme was driven by the content of the data. The structure was derived from the areas discussed in the comments from the maintenance personnel. Refinements continued throughout the data collection phase as new areas were discussed.

A full-scale pretest, using the forms developed during phase I and the Langley pre-pretest, was conducted in the 314th Tactical Airlift Wing at Little Rock AFB,

Arkansas. Subject sampling and scheduling, and interview procedures and forms (see the appendix) were finalized. The emphasis in selection of personnel to be interviewed was to obtain people from every level and specialty. A list identifying personnel to be interviewed was sent to the project liaison officer in the wings selected. If substitutions were made, the substitutes would be of the same organization, AFSC, and sex. Occasionally, the subject's schedules precluded them from participating. However, the interviewers believed the research was supported by the wings and there were no substitutions made in an attempt to bias inputs to the study.

Each interview lasted approximately one hour following the pattern listed in Figure 4-1. Each interviewer used this procedural checklist during the interview. It was made clear that "things done right" were as important as impediments to effective maintenance because methods found effective by one organization might be useful for others. The notes were transcribed by statement to the data reduction forms immediately following the interview and at that time categorized up to three times in the developed scheme (see Tables 5-1 through 5-6, Chapter V).

Phase II accomplished the following:

1. The interview procedures were devised, tested, and refined, on the basis of tryouts conducted at three Air Force installations.

2. Forms were prepared, tested and revised considerably to improve usability and readability.

3. The data categorization scheme evolved from a "bare-bones" model to a scheme with approximately 200 usable categories.

4. Computer software was prepared to accomplish data entry, file manipulation, and data output.

5. The pretests showed that careful pre-trip coordination, effective procedures, and knowledgeable, attentive interviewers yielded extremely cooperative interviewees.

6. The pretests indicated that the procedures would result in data that met the goals of the data collection phase--unbiased statements from all levels of maintenance personnel about the things and circumstances that impact the performance of their jobs.

Missile Maintenance Data

The Missile Maintenance interviews were conducted as part of the AF/HRL research. The data gathering included interviews with different types of maintenance organizations: aircraft Air National Guard, Air Force Reserve, and Air Force Active units; and Minuteman and Titan Missile units. Because of the differences in the structure and type of maintenance in the two different

missile systems, only the comments from the three Minuteman wings have been included in this analysis.

Interviews were conducted with Minuteman missile maintenance personnel from Grand Forks, Minot, and White- man Air Force Bases. Table 4-1 lists the total number of individuals in SAC in the career fields of interest. In parentheses is the number of individuals interviewed. Since the focus of this study was to identify the scope of problems in missile maintenance caused by the transition from technician to supervisor within the enlisted career progression system, only those comments made by enlisted personnel were included for analysis. Where officers made statements that specifically identified problems regarding the technician to supervisor transition, additional notes have been included.

Data Analysis

The statements in the categories listed in Tables 5-1 through 5-6 in the next chapter were analyzed by two different methods. The first method applied to all categories, and involved classifying the statements as negative or positive and counting the line units. A statement was considered negative if it discussed something that was preventing the individual or the organization from performing in an efficient and effective manner. Comments that could not be classified as negative were listed as positive.

TABLE 4-1
MINUTEMAN MAINTENANCE ENLISTED FORCE STRENGTH*
AND SAMPLE SIZE

Rank	Assigned	Authorized	(Sample)
E-1 thru E-3	1,365	1,066	
E-4	<u>797</u>	<u>579</u>	
Tier 1 Total	2,162	1,645	(47)
E-5	604	636	
E-6	<u>299</u>	<u>361</u>	
Tier 2 Total	903	997	(48)
E-7	185	230	
E-8	94	135	
E-9	<u>39</u>	<u>70</u>	
Tier 3 Total	318	435	(48)

*The numbers were taken from the 316XX, 316X2, 443X0, and 445X0, Minuteman Missile Maintenance AFSCS (Pitken).

Line units for the purpose of this research are sixty spaces long. When the statements were coded and added to the computerized data base, there were gaps, blank spaces between some words, and variation in how words were abbreviated. An assumption of this research is that these types of errors are random and consistent throughout the categories. The number of line units for a statement was then recorded on a summary sheet (see Figure 4-3) in the column for the appropriate enlisted tier. These entries were then summed for each category and are listed in Tables 5-1 through 5-6 in Chapter V. This measurement is intended to give an indication of the amount of negative or positive discussion by each tier regarding each topic.

The second method of analysis involved only those categories indicated by asterisks in Tables 5-1 through 5-6 (Chapter V). These categories were selected because they contained statements about problems that may be related to the technician to supervisor transition. The comments in these categories were broken down by tier and summarized on tier tracking sheets (see Figure 4-4). These sheets include: classification as either negative or positive: weapon system and base (WSYS/Base), Minuteman II or III; a listing of cross categories that also contained the statements; line units; subject and comment numbers (SUBJ/CMT), grade: Air Force Specialty Code (AFSC); and a brief

CATEGORY 4-11

TITLE: Methods Support, Supply Procedures

NEGATIVE SUBJ AND CMT #	LU/1	LU/2	LU/3	POSITIVE			
				SUBJ AND CMT #	LU/1	LU/2	LU/3
4614-5			7	4722-3			6
4645-9			2				
4714-12		5					
4722-2			7				
4722-7			4				
<hr/>				<hr/>			
TOTALS	5	11	9				6

Fig. 4-3. Summary Sheet

TITLE: Competence, Supervisors CATEGORY: 1-2 TIER: 2

WSYS/BASE	CROSS CATEGORIES	LINE UNITS	SUBJ/CMT NUMBER	GRADE AFSC	TOTAL NUMBER OF COMMENTS:	
					SUMMARY	
MM2 29	1-8-6, 5-3-2	5	5239/2	E5/ 44370	Some people make good techs but not good supervisors, super- visors need more train- ing. If they can't supervise, don't promote.	

Actual Comments

When a person makes a certain rank, he will automatically become a supervisor. Some NCOs are good technicians but lousy supervisors; the opposite is also true. People who become supervisors should be sent to more than just a PME school. They need to be taught how to lead and supervise. If they are not capable of becoming good supervisors they should not be promoted.

TOTAL-

POSITIVE

TOTAL-

Fig. 4-4. Tier Tracking Sheet

summary of the content of the comments. An example of the type of information recorded along with the comment is shown in Figure 4-4. The tracking of WSYS/Base, AFSC, and cross categories was to allow identification of trends and linkage between categories. The SUBJ/CMT number and grade were listed to allow recovery of the comments from the full statements, if necessary. The summaries were condensed to include only key concepts mentioned by the subjects.

The relevance of each of the categories, based on the number of line units relative to the total for each tier, major category, and overall, is indicated by the totals listed in Tables 5-1 through 5-7 (Chapter V). The summaries were reviewed for cohesiveness, to evaluate the problems discussed. A determination of whether or not subjects identified the same problems was made for each tier in each category and comments are included for areas which appeared to demonstrate a high degree of consistency.

After each category was evaluated by the above procedure, statements containing elements of problems that could be explained by, or appeared related to, the transition from technician to supervisor were included in each appropriate category discussion.

CHAPTER V

RESULTS

Introduction

The problems identified by the interviewed personnel were categorized under six major areas: Competence, Motivation/Morale, Equipment Support, Methods Support, Work Environment, and Personnel Policy. The results of the first method of analysis described in Chapter IV are presented in Tables 5-1 through 5-7. Because the sample sizes for tier 1 (forty-seven), tier 2 (forty-eight), and tier 3 (forty-eight) were close, no adjustment to the line units was made. The second method of analysis identified three types of categories: those surveyed but with an insufficient quantity of comments to evaluate cohesiveness, trends, and relevance to the technician to supervisor transition; those that could be evaluated for cohesiveness and trends but failed to indicate a relationship to the technician to supervisor transition; and those containing enough comments for a full evaluation. The first type of category is identified by a single asterisk in Tables 5-1 through 5-6. The latter two categories are identified by two asterisks. The discussion of these categories is presented under the appropriate major areas below. The

TABLE 5-1
COMPETENCE LINE UNIT SUMMARIES

Category	Tier 1		Tier 2		Tier 3	
	-	+	-	+	-	+
** 1-1 Technicians	25	/	0	52	/ 10	21 / 9
** 1-2 Supervisors	21	/	0	33	/ 0	12 / 5
** 1-3 Officers	7	/	5	39	/ 0	43 / 0
1-4 Civilians	0	/	0	0	/ 0	0 / 0
1-5 Men vs Women	38	/	3	18	/ 6	23 / 17
* 1-6 Education (3R's)/Intelligence	0	/	0	11	/ 0	12 / 1
** 1-7 Experience	39	/	3	90	/ 14	83 / 9
* 1-8 Training	0	/	0	3	/ 3	8 / 0
** 1-8-1 Tech School	65	/	6	61	/ 11	48 / 3
** 1-8-2 OJT	38	/	14	46	/ 0	20 / 7
** 1-8-3 FTD	72	/	4	102	/ 10	80 / 8
* 1-8-4 CUT	0	/	0	0	/ 0	0 / 0
* 1-8-5 CDC	0	/	0	3	/ 0	8 / 0
** 1-8-6 Management/PME	0	/	5	11	/ 7	18 / 0
* 1-8-7 Basic	0	/	0	0	/ 0	0 / 0

** Indicates full evaluation under second method of analysis.

* Indicates only preliminary evaluation under second method of analysis.

TABLE 5-1--Continued

Category	Tier 1		Tier 2		Tier 3	
	-	+	-	+	-	+
* 1-8-8 Ancillary/Annual/Safety/Agumentee	6	/	5		9	/
* 1-8-9 Officer	0	/	0		0	/
* 1-8-10 Human Relations	0	/	0		5	/
* 1-8-11 Proficiency/Advanced	13	/	0		7	/
TOTALS	324	/	45		490	/
					395	/
					59	

** Indicates full evaluation under second method of analysis.

* Indicates only preliminary evaluation under second method of analysis.

TABLE 5-2
MOTIVATION/MORALE LINE UNIT SUMMARIES

Category	Tier 1		Tier 2		Tier 3					
	-	+	-	+	-	+				
** 2-1 Job-Task Satisfaction	19	/	10		51	/	8	15	/	14
** 2-2 Career-Field Satisfaction	23	/	6		36	/	18	21	/	19
** 2-3 Job Status/Visibility	11	/	0		35	/	17	37	/	16
** 2-4 Desire to do Responsible, Meaningful Work	142	/	6		72	/	5	64	/	4
** 2-5 Desire to do a Complete Job	13	/	0		28	/	0	25	/	0
** 2-6 Job Involvement/Caring/Retiring on the Job	52	/	0		22	/	0	17	/	15
** 2-7 Unit Identification/Affiliation/Pride	17	/	15		19	/	24	8	/	11
** 2-8 Respect for Supervisors/Role Models	26	/	0		12	/	0	7	/	4
* 2-9 Feedback	6	/	0		0	/	0	0	/	0
* 2-9-1 Information	0	/	0		0	/	12	15	/	10
** 2-9-2 Evaluation/Approval/Appreciation	22	/	4		19	/	10	23	/	6
* 2-9-3 Awards and Rewards	14	/	0		14	/	6	13	/	0
* 2-10 Reasons for Remaining in AF	0	/	0		0	/	4	0	/	0
* 2-10-1 Patriotism	0	/	5		0	/	0	4	/	3
* 2-10-2 Job Security/Steady Pay	4	/	11		5	/	4	0	/	0

61

** Indicates full evaluation under second method of analysis.

* Indicates only preliminary evaluation under second method of analysis.

TABLE 5-2--Continued

Category	Tier 1		Tier 2		Tier 3	
	-	+	-	+	-	+
* 2-10-3 Job Broadening Experience	1	/	6	/	0	/
* 2-10-4 Desire to Learn a Trade	2	/	6	/	4	/
* 2-11 Cooperation/Competition/Conflict (among individuals or units)	0	/	0	/	0	/
** 2-11-1 Within Maintenance	89	/	91	/	46	/
* 2-11-2 Maintenance vs Other	14	/	25	/	19	/
* 2-12 Discipline	0	/	14	/	0	/
** 2-12-1 Excessive	39	/	4	/	5	/
* 2-12-2 Insufficient	13	/	0	/	0	/
* 2-12-3 Consistency	2	/	0	/	7	/
2-13 Living Conditions	0	/	0	/	0	/
2-13-1 Off-Base Housing	0	/	0	/	0	/
2-13-2 On-Base Housing	0	/	5	/	4	/
2-13-2-1 Privacy	0	/	0	/	4	/
2-13-2-2 Noise, Horseplay	0	/	0	/	2	/
2-13-2-3 Inspections	6	/	0	/	3	/
2-13-2-4 Family Housing	0	/	2	/	9	/
2-13-3 Food Services	0	/	0	/	3	/

** Indicates full evaluation under second method of analysis.

* Indicates only preliminary evaluation under second method of analysis.

TABLE 5-2--Continued

Category	Tier 1		Tier 2		Tier 3	
	-	+	-	+	-	+
2-13-3-1 Quality	0	/	0	/	0	/
2-13-3-2 Schedule	2	/	0	/	0	/
2-13-3-3 Availability	0	/	0	/	0	/
2-14 Recreation	8	/	7	/	10	/
2-15 Social Interactions/Social Environment	12	/	3	/	3	/
2-16 Educational Opportunities	7	/	0	/	15	/
2-17 Family Life/Personal Life (effect of TDY, overtime, PCS, etc.)	5	/	0	/	4	/
2-18 Base Services (e.g., hospital, day care)	14	/	0	/	12	/
2-19 Discrimination	0	/	0	/	0	/
2-19-1 Sex	25	/	0	/	5	/
2-19-2 Race	0	/	0	/	0	/
2-19-3 Marital Status	0	/	0	/	0	/
2-19-4 Civilian-Military	1	/	0	/	0	/
2-19-5 Rank	5	/	0	/	0	/
* 2-19-6 Maintenance vs other	6	/	0	/	0	/
2-20 Drug/Alcohol Abuse	4	/	0	/	0	/
TOTALS	604	/	103	/	190	/

** Indicates full evaluation under second method of analysis.

* Indicates only preliminary evaluation under second method of analysis.

TABLE 5-3
EQUIPMENT SUPPORT LINE UNIT SUMMARIES

Category	Tier 1		Tier 2		Tier 3	
	-	+	-	+	-	+
3-1 Hand Tools	5	/	6	/	6	/
3-2 Test Equipment	27	/	17	/	37	/
3-3 AGE	5	/	0	/	0	/
3-4 Automatic Test Equipment	7	/	0	/	7	/
3-5 Special Tools	13	/	6	/	21	/
3-6 Safety Equipment	0	/	3	/	0	/
3-7 Protective Clothing	12	/	8	/	0	/
3-8 Warm Clothing/Heaters	12	/	3	/	0	/
3-9 Weapons System	0	/	0	/	0	/
3-9-1 Prime Equipment	2	/	7	/	6	/
3-9-2 Subsystems	3	/	0	/	5	/
3-9-3 Support Systems	21	/	29	/	33	/
3-9-4 Age/Obsolescence	21	/	36	/	104	/
3-9-5 Design for Maintainability	0	/	7	/	6	/
3-9-5-1 Accessibility	11	/	0	/	0	/
3-9-5-2 Ease of Troubleshooting/BITE	0	/	0	/	0	/
3-9-5-3 Ease of Replacement	0	/	0	/	7	/
3-9-6 Procurement	6	/	6	/	27	/

TABLE 5-3--Continued

Category	Tier 1		Tier 2		Tier 3	
	-	+	-	+	-	+
3-10 Spare Parts	0	/	0	/	0	/
3-10-1 Availability	32	/	0	53	/	1
3-10-2 Serviceability (Spares that don't work)	11	/	0	3	/	0
3-10-3 Reliability (Spares that fail quickly)	0	/	0	5	/	0
3-10-4 Maintenance Concept	28	/	0	28	/	0
3-10-5 Procurement	4	/	0	0	/	0
3-10-5-1 Normal	0	/	0	10	/	0
3-10-5-2 Local Purchase	2	/	0	0	/	0
3-10-5-3 Local Fabrication	4	/	0	3	/	0
3-10-6 Cannibalization	0	/	0	12	/	0
3-10-7 WRS Kit	0	/	0	0	/	0
3-10-8 Bench Stock	8	/	0	4	/	0
3-11 Misappropriation	0	/	0	0	/	0
TOTALS	234	/	2	246	/	24
						473 / 10

TABLE 5-4
METHODS SUPPORT LINE UNIT SUMMARIES

Category	Tier 1		Tier 2		Tier 3	
	-	+	-	+	-	+
4-1 T.O.s	18	/	0	23	/	0
4-1-1 Troubleshooting	18	/	0	7	/	0
4-1-2 Repair/Replacement Procedures	8	/	0	3	/	0
4-1-3 IPBs Wiring Diagrams/Schematics	0	/	0	6	/	0
4-2 Inspection Work Cards	0	/	0	0	/	0
4-3 Forms	0	/	0	11	/	0
4-4 Suggestion Program/AFTO Forms	12	/	0	16	/	0
4-5 Computer Maint Management Aids	0	/	0	20	/	0
4-6 Job Scheduling	17	/	0	18	/	0
4-7 MOIs	4	/	0	0	/	0
4-8 Local Work Rules (unwritten)	7	/	0	0	/	0
4-9 Regulations	0	/	0	34	/	0
4-10 Tool Management Procedures (CTK)	4	/	0	5	/	0
4-11 Supply Procedures	<u>14</u>	/	<u>0</u>	<u>68</u>	/	<u>6</u>
TOTALS	102	/	0	211	/	6
						180 / 3

TABLE 5-5
WORK ENVIRONMENT LINE UNIT SUMMARIES

Category	Tier 1		Tier 2		Tier 3	
	-	+	-	+	-	+
5-1 Physical	0	/	0	/	0	/
5-1-1 Cold/Heat	9	/	2	/	0	/
5-1-2 Lighting	0	/	0	/	3	/
5-1-3 Noise	0	/	0	/	6	/
5-1-4 Space/Facilities/Restrooms	13	/	0	/	40	/
5-1-5 Transportation	5	/	0	/	6	/
5-1-5-1 Serviceability	14	/	0	/	9	/
5-1-5-2 Availability	3	/	0	/	10	/
5-1-6 Dirt/Grease	0	/	0	/	0	/
* 5-2 Psychological	0	/	0	/	0	/
* 5-2-1 Supervisory Style/Techniques	0	/	0	/	22	/
* 5-2-1-1 NCOs	129	/	17	/	37	/
* 5-2-1-2 Maintenance Officers	21	/	5	/	23	/
* 5-2-1-3 Squadron Commander	6	/	0	/	10	/
* 5-2-1-4 DCM and Higher Management	29	/	1	/	73	/
					176	/
					37	

** Indicates full evaluation under second method of analysis.

* Indicates only preliminary evaluation under second method of analysis.

TABLE 5-5--Continued

Category	Tier 1		Tier 2		Tier 3	
	-	+	-	+	-	+
* 5-2-2 Work Pressure	9	/	4	/	4	/
5-2-2-1 Flying Schedule (Alert Rate)	0	/	0	/	0	/
** 5-2-2-2 Requirements for Perfection	32	/	0	38	/	2
* 5-2-2-3 Deadlines/Inadequate Time	16	/	0	18	/	6
* 5-2-2-4 Mobility Exercises	7	/	0	7	/	0
* 5-2-2-5 TDY	0	/	0	0	/	0
** 5-2-2-6 Length of Work Days/Weeks/Shifts	95	/	8	48	/	12
** 5-2-2-7 Inspections (ORI, CAFE, QC, IG, MSEP)	9	/	7	56	/	2
* 5-2-3 Work Distractions/Non-Primary Duties	5	/	0	4	/	0
* 5-2-3-1 Details (up to one week)	22	/	0	9	/	0
5-2-3-2 TDY (up to 90 days)	0	/	0	0	/	0
* 5-2-3-3 Extra Duties	0	/	0	14	/	0
* 5-2-3-4 Training (e.g., general military training)	0	/	0	8	/	0
* 5-2-3-5 Meetings	0	/	0	0	/	0
* 5-2-3-6 Appointments (e.g., records check, dental)	0	/	0	0	/	0

68

** Indicates full evaluation under second method of analysis.

* Indicates only preliminary evaluation under second method of analysis.

TABLE 5-5--Continued

Category	Tier 1		Tier 2		Tier 3	
	-	+	-	+	-	+
** 5-2-3-7 Administative Paperwork	8	/	0		23	/
* 5-2-3-8 Task Interruptions	3	/	0		4	/
** 5-2-4 Vertical Communication	33	/	0		40	/
* 5-2-5 Camraderie/Kidding/Horseplay	0	/	0		0	/
* 5-3 Organizational	0	/	0		0	/
* 5-3-1 Maintenance Organizational Structure	14	/	0		25	/
* 5-3-1-1 AFR 66-5	0	/	0		0	/
* 5-3-1-2 AFR 66-1	0	/	0		0	/
* 5-3-1-3 Crew Chief System	0	/	0		0	/
** 5-3-1-4 Job Control	35	/	0		38	/
** 5-3-1-5 Quality Control	51	/	2		60	/
* 5-3-1-6 Span of Control	0	/	0		21	/
* 5-3-1-7 Unity of Direction/Command	5	/	0		11	/
* 5-3-2 Job Structure	0	/	2		0	/
** 5-3-2-1 AFSCs	7	/	0		40	/
** 5-3-2-2 Duties within AFSCs	20	/	3		98	/
* 5-3-2-3 Unpleasant Duties	0	/	0		10	/
					1	/

** Indicates full evaluation under second method of analysis.

* Indicates only preliminary evaluation under second method of analysis.

TABLE 5-5--Continued

Category	Tier 1		Tier 2		Tier 3	
	-	+	-	+	-	+
** 5-3-2-4 Unwanted Supervisory Role	5	/	0		14	/
5-3-3 Fiscal Management	22	/	0		23	/
* 5-4 Manpower Availability	0	/	0		11	/
** 5-4-1 Technicians	40	/	11		85	/
** 5-4-2 Supervisors	21	/	0		10	/
* 5-4-3 Officers	6	/	0		0	/
5-5 Safety	0	/	0		0	/
5-5-1 Physical	17	/	0		19	/
5-5-2 Procedural	11	/	4		7	/
* 5-6 Mission/War Readiness	6	/	5		13	/
TOTALS	728	/	71		1004	/112
					0	/
					1187	/128

** Indicates full evaluation under second method of analysis.

* Indicates only preliminary evaluation under second method of analysis.

TABLE 5-6
PERSONNEL POLICY LINE UNIT SUMMARIES

Category	Tier 1		Tier 2		Tier 3	
	-	+	-	+	-	+
* 6-1 Selection (into AF)	17	/	20	/	7	/
* 6-2 Promotion	0	/	0	/	4	/
** 6-2-1 Criteria/APRS	19	/	34	/	43	/
* 6-2-2 Frequency	4	/	5	/	0	/
* 6-2-3 SKTs	22	/	3	/	12	/
* 6-2-4 WAPS	14	/	18	/	0	/
* 6-2-5 "Up-or-Out"/High Year of Tenure	0	/	0	/	0	/
** 6-2-6 Career Path Availability	6	/	28	/	73	/
* 6-2-7 Below the Zone	13	/	8	/	0	/
* 6-2-8 Local Authority	0	/	0	/	0	/
** 6-3 Assignment (AFSC, Primary Job)	84	/	129	/	146	/
** 6-4 Retention	63	/	101	/	138	/
* 6-5 Transfer (PCS)	0	/	0	/	0	/
* 6-5-1 Frequency	0	/	9	/	5	/
** 6-5-2 Location	18	/	18	/	13	/
* 6-5-3 Involuntary Transfer	0	/	0	/	3	/

** Indicates full evaluation under second method of analysis.

* Indicates only preliminary evaluation under second method of analysis.

TABLE 5-6--Continued

Category	Tier 1		Tier 2		Tier 3	
	-	+	-	+	-	+
** 6-5-4 Duration of Stay	0	/	6		26	/
* 6-5-5 Spouse	0	/	0		0	/
6-6 Pay	5	/	0		14	/
6-6-1 Basic Rates and Effects	6	/	5		9	/
6-6-1-1 Food Stamps	0	/	0		0	/
6-6-1-2 Working Spouse	0	/	0		0	/
6-6-1-3 Moonlighting	0	/	0		0	/
6-6-2 BAS/BAQ	6	/	2		0	/
6-6-3 Incentive (Flight Hazardous Duty)	10	/	0		14	/
6-6-4 Clothing Allowance	6	/	0		0	/
6-7 Benefits	0	/	0		0	/
6-7-1 CHAMPUS Health Benefits	6	/	0		4	/
6-7-2 Tuition Assistance	0	/	0		0	/
6-7-3 Reimbursement of PCS Expenses	0	/	0		0	/
6-7-4 Housing Referral Office/Sponsor Program	0	/	0		0	/
6-7-5 BX and Commissary	0	/	0		3	/
6-7-6 Retirement Pension and Other Benefits	3	/	0		0	/

** Indicates full evaluation under second method of analysis.

* Indicates only preliminary evaluation under second method of analysis.

TABLE 5-6--Continued

Category	Tier 1		Tier 2		Tier 3	
	-	+	-	+	-	+
6-7-7 Overseas COLA	0	/	0	/	0	/
6-7-8 Leave	0	/	0	/	7	/
6-8 Enlistment/Reenlistment Incentives	0	/	0	/	0	/
6-8-1 Reenlistment Bonus/Leave Buy-Back	18	/	2	/	6	/
6-8-2 Guaranteed Training	0	/	0	/	0	/
6-8-3 Base of Preference	6	/	0	/	0	/
6-8-4 VEAP/G.I. Bill	3	/	3	/	7	/
6-9 Recruiting/Indoctrination	25	/	0	/	11	/
6-10 Involuntary Separation	4	/	6	/	4	/
6-11 Draft vs All Volunteer Force	0	/	0	/	0	/
* 6-12 Weight Program	0	/	0	/	0	/
* 6-13 AFR 35-10	7	/	2	/	2	/
6-14 Social Actions/EOT	0	/	0	/	0	/
TOTALS	365	/	40	/	480	/
					56	/
					636	/
					36	

*Indicates only preliminary evaluation under second method of analysis.

TABLE 5-7
MAJOR AREA AND TIER LINE UNIT SUMMARIES

Major Area	Tier 1		Tier 2		Tier 3		Major Area Totals
	-	+	-	+	-	+	
Competence	324	/	45		490	/	61
Motivation/Morale	604	/	103		544	/	190
Equipment Support	234	/	2		246	/	24
Methods Support	102	/	0		211	/	6
Work Environment	728	/	71		1,004	/	112
Personnel Policy	365	/	40		480	/	56
TIER TOTALS	2,357	/	261		2,975	/	449
					3,377	/	384
							8,709 / 1,094

main problems are identified for a tier if there appeared to be consistency within the tier. The discussion is not exhaustive of all the statements in a category. So few positive comments were made that in most cases they have not been discussed. Statements that are either explicitly tied to, or may be related to, the technician to supervisor transition have been included in the category discussion.

Competence Categories Reviewed

1-1 Technicians

Tier 1 had four unrelated statements. Tier 2 had ten negative statements with all but one of them about lack of experience or low knowledge levels. An example of the comments is:

Technicians have a lack of education on the job--systems knowledge--because they aren't allowed to troubleshoot.

Tier 3 had five negative statements about technician's abilities. None of the tiers mentioned the technician to supervisor transition.

1-2 Supervisors

Tier 1 had three negative statements about low experience levels. One statement was:

. . . because of manning people are being forced into the [team chief] position, way before they are ready. . . .

Tier 2 had seven negative statements, most regarding the effective utilization of supervisors. One statement was:

When a person makes a certain rank, he will automatically become a supervisor. Some NCOs are good technicians but lousy supervisors. . . . If they aren't capable of becoming good supervisors, they should not be promoted.

One of the officers interviewed in the study made a statement regarding such individuals:

Time-in-grade and time-in-service, plus inflated APRs, will get people promoted even though they do bad on WAPS tests. These people, E-5s and E-6s, are promoted into a supervisor position they don't want, or can't do. Some of those people should remain technicians instead of becoming a bad supervisor.

Tier 3 had three unrelated comments.

1-3 Officers

Tier 1 only had one statement. Tier 2 had eight negative statements, most of them about junior officers (Lieutenants and Captains). A typical statement was:

MMT chiefs and flight NCOs don't like having officers as their APR reporting officials. The NCOs don't think the officers understand the work well enough to know if they are doing a good job or not. The team chief doesn't know if he works for the shop NCOIC or the flight officers. The NCOIC is taken out of the APR chain.

Tier 3 had eleven negative statements, most about the junior officers' abilities and awkwardness of their placement in the chain of command with little or no maintenance experience.

1-7 Experience

Tier 1 had nine negative statements, all about low manning or lack of experience. One statement was:

The position of team chief used to mean something. Now people are placed into the job without enough experience to handle it. People need at least 6 months to a year on a team as a member before they are given the team chief job. Yet, because of manning, people are being forced into the position, way before they're ready. They make mistakes, are not backed up, get tired and quit. Then they become useless to the Air Force and wing.

Tier 2 had eighteen negative statements, but covered a wider range of issues, among them: cross-trainees (those individuals coming into a field with rank achieved in another career field), staff rotation, Ground Launch Cruise Missile (GLCM) draw on manning levels, TTB instructor experience, and the improper use of technical data. One comment about organizational structure and policy regarding flight officers was:

The flight officer program leads to micromanagement. The lower-level supervisors are told exactly what to do. They have no freedom of choice on how they are to do their job. This hinders the flow of information, career progression, and keeps a guy from getting the experience he needs to become a good middle manager.

There were nineteen negative statements in tier 3, most about low experience levels throughout the organization.

1-8-1 Training, Tech School

Tier 1 had twelve negative statements, most about the material covered at tech school not being enough, current, or relevant. Tier 2 had fourteen negative statements and tier 3 had twelve negative statements, both groups paralleling tier 1 in content.

1-8-2 Training, OJT

Tier 1 had eight negative statements, most about not getting enough good OJT. It also had four positive statements about OJT benefits. One comment was:

I try to work OJT one on one . . . the times when we're not busy, I can grab any piece of equipment and train, and that's highly encouraged by the supervisor.

Tier 2 had seven negative statements and tier 3 had four, most about the difficulty in conducting good OJT with low experience levels.

1-8-3 Training, FTD

The comments in this category refer to aspects of training done by the TTB. Tier 1 had fifteen, tier 2 had twenty-one, and tier 3 had eighteen negative comments. The majority in each tier dealt with the wait incoming personnel encounter between arrival on base and entry into TTB training. An example of the comments is:

We get people into the organization who had to wait as much as 6 months for training. Their morale is low, their productivity nil, and they make a lot of paperwork for us.

1-8-6 Training, Management/PME

Tier 1 had a positive comment about the value of Leadership School. Tier 2 had three negative and two positive comments in this category. Two of the negative comments were:

When anybody goes to Leadership School, it's because of pressure. It's a square to fill in my career.

If you can read and understand, you can get promoted. Because you get promoted, you are placed in charge of other people. However, as much as you read and understand, no one teaches you how to apply your knowledge to the people you are supposed to lead. The only way you learn human relations in the Air Force is by being wrong most of the time.

The positive statements in tier 2 were:

I think the Air Force is really emphasizing management and leadership classes like PME because they realize, with such a young force, they are needing more and more supervision.

PME is very good and everyone should have to go. People (complain) about going, but once they get to school, they like it. PME teaches you a different way of doing things. It gives you a way to lead people instead of just yelling at them.

Tier 3 had four negative comments. They were about the inability to use concepts taught in PME on the job, and the need for more PME for NCOs.

Motivation/Morale Categories Reviewed

2-1 Job-Task Satisfaction

Tier 1 had four negative and three positive statements in this category. Of the negative, three dealt with the job itself but one of the statements included the following comment:

. . . the only place for me to go in this career field is to supervision in the shop, QC, or 3901st.

. . .

One of the positive comments in tier 1 was:

I like my career field. I'm a hands-on person. I like to get my hands dirty. That's why I've been a Sergeant for 3 years: I'm not ready for a paper career field yet. I don't know if I could hack it. The only way I can avoid the paper if I get another stripe is to transfer to the other shop and be a team chief and go out to the field.

Tier 2 had eleven negative statements, most of them expressed attitudes about specifics of the work the individuals were required to do in their career field. Tier 3 had four negative and three positive statements. The negative were unrelated. The positive emphasized the challenging nature of the work.

2-2 Career Field Satisfaction

All tiers had six or seven negative statements that were similar and covered a variety of topics. None were explicitly related to the technician to supervisor transition.

2-3 Job Status Visibility

Tier 1 had three unrelated negative statements. Tier 2 had seven negative statements. Most were about the status individuals receive relative to the difficulty of the work they do. Tier 2 had four positive statements about various work incentives. Tier 3 had eight negative statements that indicated attitudes of not feeling like an important component of the Air Force because of poor treatment. The three positive statements in tier 3 were unrelated.

2-4 Desire to do Responsible, Meaningful Work

The twenty-seven negative comments in tier 1 dealt primarily with the wait for training and the use of personnel trained for missile maintenance to work in VECB. Tier 2 had four negative statements that were similar to those in tier 1. Tier 3 had seventeen statements that were about a wider variety of issues: manning levels, preparation for dispatch, VECB work, and the wait for training.

2-5 Desire to do a Complete Job

All three tiers had four or five negative statements that covered a variety of areas. None of these statements was related to the technician to supervisor transition.

2-6 Job Involvement/Caring/Retiring on the Job

Tier 1 had ten negative statements about a wide variety of problems: females not wanting to work, the wait for training, and bad attitudes. Tiers 2 and 3 had four and five negative comments about similar issues. Tier 3 had four positive comments. One supervisor stated:

My challenge in VECB lies in convincing an individual he's doing an important job. Every job can be routine, and we need to make them feel indispensable. We tell them that every group is really a support agency to others. We treat them like they are somebody and like they count.

AU-A189 356

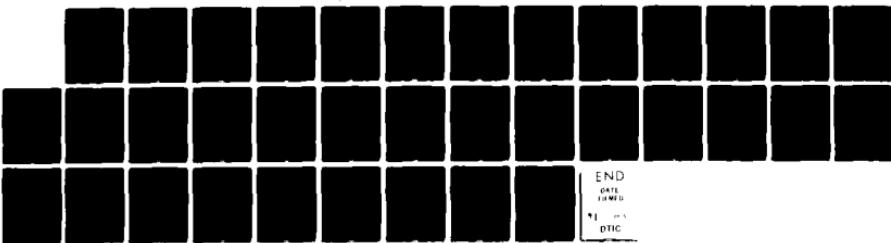
MINUTEMAN MISSILE MAINTENANCE AND ENLISTED CAREER
PROGRESSION PROBLEMS(U) AIR FORCE INST OF TECH
WRIGHT-PATTERSON AFB OH SCHOOL OF SYST.. D R FORBES
SEP 83 AFIT-LSSR-24-83

UNCLASSIFIED

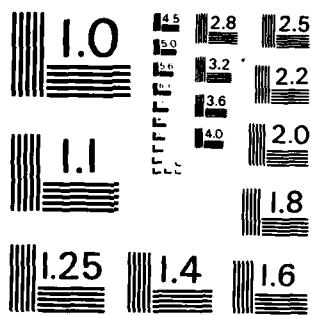
F/G 5/9

2/2

NL



END
DATE
TIME
1 1983
DTIC



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS - 1963 - A

2-7 Unit Identification/
Affiliation/Pride

This category contained four to six positive statements in each tier. These discussed the importance of good performance in establishing unit identification, affiliation, and pride. Tiers 1 and 2 both had three negative comments that indicated desires for more unit identification or dissatisfaction with unit performance. No statements were related to the technician to supervisor transition.

2-8 Respect for Supervisor/
Role Models

Tier 1 had six negative comments on a variety of issues. One statement was:

Supervisors who look over your shoulder often don't handle people well. There's a few who will comment here and there and insult your intelligence. I've been in the field long enough that I know the portion of the job I do. He just asks questions to test me, and it is very irritating. I don't respect that person.

Tiers 2 and 3 had two negative comments each involving four separate problems.

2-9-2 Feedback, Evaluation/
Approval/Appreciation

Tiers 1 and 2 had four, and tier 3 had five negative comments. All related there was not enough appreciation and recognition for the work maintenance personnel do. Each tier had at least one positive statement. Two of these statements were:

You work better when you want to earn recognition from your supervisor. It doesn't have to be all praise, as long as I know that my supervisor knows what I'm doing, and is interested in it. That's especially important for people who are away from home for the first time.

The management walks through all the time. The DCM comes by almost every morning. He doesn't pick on negative things, but lets them know he's interested. The Vice DCM walked around after 3901st and congratulated my guys in VECB as being the ones who sent them to the field. You can see what that did by the look on their faces. They like being appreciated and needed.

2-11-1 Cooperation/Competition/ Conflict, Within Maintenance

Tiers 1 and 2 both had seventeen negative statements in this category. The problems ranged from areas involving support of teams in the field to conflict between teams that must work together on site. Tier 3 had ten negative statements, and six positive statements. There were no statements that could be related to the technician to supervisor transition.

2-12-1 Discipline, Excessive

Tier 1 had seven negative statements, whereas tier 2 had one and tier 3 had two. Most of the statements in tier 1 were about the discipline administered in cases related to safety violations. No statements in this category could be related to the forced transition from technician to supervisor.

2-19-5 Discrimination, Rank

Tiers 1 and 2 had two negative comments each on four different items. One statement was:

There is an OJT Trainer in the shop, but I do most of the training. He was put in that position because of rank and overall maintenance experience.

Tier 3 had six negative statements, all of them about officer/NCO segregation of base housing, and Officer and NCO Clubs.

Work Environment Categories Reviewed

5-2-1-1 Supervisory Style/ Techniques, NCOs

Tier 1 had fourteen negative statements that indicated a variety of criticisms. Most of the statements dealt with particular issues: supervisor's pet projects, oversupervision, supervisor's attitudes about work, and supervisors not backing up subordinate's decisions. The four positive comments were about the unity maintained by appropriate supervisory actions.

Tier 2 had seven negative statements about supervisors' attitudes, lack of flexibility, application of pressure, and lack of support for programs. Two of the statements were:

The supervisors in some of the work centers have a bad attitude. They tell their people they don't have to do things the way they were taught in TTB.

When you get too much supervision looking over the shoulder you get nervous and guys will quit at the littlest problem. The added pressure of QC make it

too much. One guy admitted to using drugs and is being separated because he didn't like the pressure.

An example of the positive statement is:

If a supervisor is good, the younger people will want to follow him. If he knows his job and can teach the troops, he'll have a good team. They'll also work better for him if he can explain the big picture and how they fit into it, instead of just saying "we're doing it because we're told to."

Tier 3 had nine negative comments about similar issues, and three positive regarding supervisors' attempts to improve shop morale.

5-2-1-4 Supervisory Style/
Techniques, DCM and
Higher Management

Tier 1 had only a few statements in this category: five negative and one positive. The negative comments were on unrelated issues. Tier 2 had fifteen negative statements, the majority on micromanagement and crisis-management. Two examples are:

There's a lot I consider mismanagement; too much crisis management.

Something that grates on most teams is micro-management. MMTs have officer flight chiefs. All it does is put them in line of the supervisors and, in effect, makes them MMT chiefs. The team chief no longer has the authority to go ahead with a repair, but has to get approval from the officer who usually doesn't know what's going on anyway.

Tier 3 had twenty-six negative statements, covering a wider variety of issues. Included in these comments were:

It seems like bored staff people create new tasks so they will have something to do. They don't realize how much load they are putting on supervisors. They don't get out to see what supervisors have to do.

Work pressure can get heavy here. Sometimes we want to do a job a certain way and someone else [in the DCM staff] wants us to do it another way. It is my squadron. Let me do it my way, as long as it is within the T.O. [technical order].

Sometimes higher level supervisors who want to make general don't want to make decisions, or they make them on a political basis. They don't make decisions on the basis of what needs to be done for maintenance.

Everything has the same priority. Everything is right now. I would like to see the wing establish and keep priorities. Also, they can't keep schedules. That frustrates the kids.

Of the eight positive statements in the tier, five came from the same base. Two of these statements were:

The senior staff is easy to go to, to talk to, someone to find out things. You don't have to make it official. We get a lot of things done that way. They also come to us rather than make official threats. . . .

There is nothing that makes it hard for me to do my job. The management in this wing is superb. It's some of the finest I've ever seen. People work together well, and there's a lot of cooperation and communication. The record speaks for itself and shows this wing does well and doesn't have any serious morale problems.

5-2-2-2 Work Pressure, Requirements for Perfection

Tier 1 had only five negative statements in this category. Several were about the emphasis that QC places on small details in procedures. Tier 2 had eight negative statements that were similar to those in tier 1. Tier 3

had six negative statements that included the following:

In missiles the higher you go the more pressure there is. You get away from tech problems and work, but they still want you to be an expert.

5-2-2-6 Work Pressure,
Length of Work Days/
Weeks/Shifts

Tier 1 had twenty-four negative statements about unscheduled work, overtime, long shifts, unnecessary standby, inability to work on education, and the driving time to the sites. One shop is overmanned, apparently in preparation for the draw down that will occur for GLCM.

This overmanning has created problems:

Even when we're trained and dispatching, there is not enough to do. We'll put 10 teams up in a day, but only 4 or 5 will go, because nothing ever breaks. You're supposed to get 12 dispatches a month, but probably only get 80 percent of those. When you're not dispatching, there is nothing to do but sit home and wait.

Tier 2 had eleven statements similar to tier 1.

Tier 3 had twenty-two statements that focused more on the long hours than did the statements in the first two tiers.

Some examples are:

Missile people are supposed to work 12 dispatches a month, 12 hours per dispatch. This wing works their dispatch teams 14 and 14. I'm not sure if SAC did it or the DCM. But there is just too much for the average person to do.

Family problems hurt a lot of young people. Long dispatches are hard work, make them tired and irritable. They want to rest, and the family wants time.

We need better quarters for single men. They have 2-man rooms that are too small. There isn't enough room, considering the job and the amount of time we take from them. They need privacy when they are off.

5-2-2-7 Work Pressure, Inspections
(ORI, ORE, CAFE, QC, MSEP)

Tier 1 had only two negative statements. Tier 2 had ten negative statements about QC standards and frequency of inspections. Some individuals recommend a change to a quality assurance approach to inspection:

Do away with evaluations by QC and the 3901st evaluation team. They should be replaced by an on-the-spot inspection and after-the-fact inspection, instead of watching someone put on a show.

Tier 3 had eighteen negative comments that were similar to those in tier 2. One statement was:

People need to respect my judgement and experience. Instead of showing confidence in you, management wants you to justify and checks up on you. In preparation for IG or 3901st we have to fill out silly forms showing completion and that everything is in order. Someone who's been in SAC for a whole career knows the importance of inspections, and they should just trust me to get things done.

5-2-3-7 Work Distractions/
Non-Primary Duties,
Administrative Paperwork

Tier 1 had two negative statements, tier 2 had five, and tier 3 had eight. Most statements were about excessive and unnecessary paperwork, paperwork retarding action, and paperwork keeping supervisors too busy to spend time in the shops. The only positive statement

included in this category was by an NCOIC in VECB in tier 3 and was:

I really like this job. This is my second time in it. It is different every day, and I have a lot of freedom. I also spend most of my time talking to people and very little on paperwork.

5-2-4 Vertical Communication

Tier 1 had six negative statements. Some examples of the comments are:

There is a lack of communication between job control, QC, and the maintenance teams in the field.

Because of lack of communication and morale in this field I've tried to crosstrain out of it.

We need better communication and organization. When something is supposed to be done ahead of time, it just isn't done. People don't get the word of what they are supposed to do. To get the job done you are supposed to coordinate.

We don't get enough feedback from the upper levels, either good, bad, or indifferent.

Tier 2 had eight negative statements that included a wider variety of issues than those identified in tier 1. Of significance to the technician to supervisor transition was the following statement:

I'm not a supervisor. I don't want to be a supervisor. Management doesn't listen to the supervisors anyway, so why have them. Management says they listen to their supervisors. Maybe they do, but they don't hear what they are saying. How can they hear what we say, when all they ever do is tell us how to do our jobs?

Tier 3 had three negative statements and two positive. All were about separate issues.

5-3-1-4 Maintenance Organization Structure, Job Control

All tiers had six negative statements, covering low experience levels, schedule variations, misuse of the priority system, and job control requirements for paperwork. There were no statements related to the technician to supervisor transition.

5-3-1-5 Maintenance Organization Structure, QC

Tier 1 had nine negative statements. They covered QC experience levels and attitudes about failing QC evaluations. Tier 2 had thirteen negative comments similar to those in tier 1. Tier 3 had only four negative statements that also mentioned some of the above areas. No statements could be related to the technician to supervisor transition.

5-3-2-1 Job Structure, AFSCs

Tier 1 had only one negative statement, but tier 2 had nine. The statements in tier 2 discussed personnel in VECB not needing missile maintenance training, corrosion control in missiles not being nearly as challenging as in aircraft, and the excessive number of tasks in the missile AFSCs. Tier 3 had four negative statements on issues similar to those in tiers 1 and 2. No statements could be related to the technician to supervisor transition.

5-3-2-2 Job Structure,
Duties Within AFSCs

Tier 1 had four negative statements about the inadequacy of tech school training for AFSC requirements, VECB not needing missile maintenance training, and teams not completing all their work in the field. Tier 2 had seventeen negative statements. Besides the issues identified by tier 1, these statements discussed corrosion control duties.

Tier 3 had eleven negative statements. Among them was the following:

How do you determine the productivity of a supervisor? He may sit and drink coffee all day. But when it's time to make decisions, he's got to be there.

5-3-2-4 Job Structure, Unwanted
Supervisory Role

All of the statements in this category pertain to the forced transition from technician to supervisor. Because there were only a few, and their importance in this study, each has been included below.

Tier 1:

I like my career field. I'm a hands-on person. I like to get my hands dirty. That's why I've been a sergeant for 3 years; I'm not ready for a paper career field yet. I don't know if I could hack it. The only way I can avoid the paper if I get another stripe is to transfer to the other shop and be a team chief and go out to the field.

Tier 2:

I spend a lot of time chasing paper. Maintenance shops could do with an admin type. It would be better

if I could concentrate on the job. They spend a lot of money to train a guy and then use him for admin work. When you make Staff Sergeant or more and get good at the job they make you do admin work.

I'm not a supervisor, I don't want to be a supervisor. Management doesn't listen to the supervisors anyway, so why have them. Management says they listen to their supervisors. Maybe they do, but they don't hear what we are saying. How can they hear what we are saying when all they ever do is tell us how to do our jobs?

When a person makes a certain rank, he will automatically become a supervisor. Some NCOs are good technicians but lousy supervisors; the opposite is also true. People who become supervisors should be sent to more than just a PME school. The need to be taught how to lead and supervise. If they aren't capable of becoming good supervisors, they should not be promoted.

Tier 3:

I would much rather be a technician than a supervisor. I like to work with my hands. I wanted to be in technical engineering. Those are the people who solve the hard technical problems that are not covered by the T.O.s. But it's too late for me to go into that work now. The highest you can go there is E-7. I'm an E-7 now and I'd like to make E-8.

Change the NCO rank structure. If we were still in the cavalry, the structure would be all right. The AF promotes people, using the Peter Principle. We should allow people the right to choose if they want to be supervisors or not.

I'm a worker. I would rather go out and do the work than supervise. It is easier to do it myself than to try to get someone else to do it as well as I would.

A variation of the Army specialist program would help the AF. We are more technical than the other services. Technicians cannot progress in the AF without becoming a supervisor. Some are satisfied being technicians and don't want to be supervisors.

5-4-1 Manpower Availability,
Technicians

Tier 1 had eleven negative statements and tier 3 had twenty-eight. Other than the problem with the shops overmanned for GLCM, the majority of statements in each of the categories dealt with low manning levels, inability of TTB to handle groups of students all at once, and SACMET methods for determining authorizations. None of the statements directly related to the transition from technician to supervisor.

5-4-2 Manpower Availability,
Supervisors

Tier 1 had five negative statements about needing more experienced NCOs, improper utilization of younger NCOs, and relations between senior NCOs. Tier 2 had three negative statements about similar issues. Tier 3 had nine negative statements that included the following:

There aren't enough senior people, so we don't keep our SSgts (E-5) at the working level long enough. We pull too many of them into supervision too soon. Once that happens in missile maintenance they never get close to work again.

There aren't enough Staffs and Techs. We're making people team chiefs 4 to 6 months after they get out of TTB. We keep close watch on them. Most can handle it. A guy out of school for 6 months can handle the basic jobs but doesn't have the experience to handle the unusual ones.

Personnel Policy

6-2-1 Promotion, Criteria/APRs

Tier 1 had four negative statements. Tier 2 had seven, and tier 3 had nine. Those in the first tier discussed the time between promotions, outside education, and the emphasis on testing in the Weighted Airman Promotion System (WAPS). Statements in the second tier also covered the inflated nature of APRs. The third tier included a comment on PME:

The Air Force has to develop some form of PME for the higher ranking NCOs. They need a course that will help them with their 9-level management AFSC. The CDCs are good, but we need to be able to go to school because that's much better.

6-2-6 Promotion, Career Path Availability

Tier 1 had two negative statements. One pertained to the forced move into supervision, the other about getting into the space command. One positive statement referred to the possibilities for travel that GLCM offered. Tier 2 contained six negative statements about the negative impact of the flight officer program on NCO growth, the four-year limitation set on assignment to staff jobs, enlisted commissioning programs, and the problem of cross trainees. Tier 3 contained eleven statements. Three discussed the forced transition from technician to supervisor and were included in that category. Several in this last tier

indicated a desire for different commissioning options.

Among the comments were:

There are a lot of people (NCOs) who are getting an education on their own. We need a way for getting the more senior ones commissioned at a higher rank than Second Lieutenant. A senior NCO should be able to start as at least a First Lieutenant.

Perhaps rank structures should be changed. Maybe we should have something like the old warrant officer program, where you get a commission after you have been in for a few years and prove yourself. You shouldn't have to wait as long to get a commission, though.

6-3 Assignment (AFSC, Primary Job)

Tier 1 had seventeen negative statements, tier 2 had twenty-six, and tier 3 had thirty-three. Those in the first tier discussed a variety of issues including women in missile maintenance, supervisory changes, and experience levels. The comments in tier 2 covered a wide variety of areas, as did those comments in tier 3. None of these statements was directly related to the transition from technician to supervisor.

6-4 Retention

Tier 1 had thirteen negative statements covering reasons why individuals intended to leave the Air Force. None of these reasons explicitly referred to the forced transition from technician to supervisor. Tier 2 had twenty-one negative statements covering similar issues

and also did not have any statements regarding the forced transition.

Tier 3 paralleled the first two tiers in content and included the following statement:

There aren't enough supervisors, and we aren't doing the best we can because of it. I only spend the minimum amount of time required to do the job. Problems or projects that need solving or planning, suffer. The supervisor is expected to be an expert technician, trainer, supervisor, and manager. Trying to be all that drives the 10-12 year guy out.

6-5-2 Transfer (PCS), Location

Tier 1 had almost as many positive comments, four, as negative, five. All of the negative comments highlighted the isolated locations. The positive mentioned base facilities, fishing and hunting, local merchants, and stability of assignment. Tier 2 had five negative and one positive that were about the same issues identified by tier 1. Tier 3 had four negative statements and two positive. None of the statements in this category could be related to the technician to supervisor transition.

6-5-4 Transfer (PCS), Duration of Stay

Tier 1 had two positive statements about the stability of assignments in missile maintenance. Tier 2 had six negative comments. One was about the effect of long tours on the organization:

People in the Missile field don't have much of a chance to move around. E-7s and E-8s stay on the same base forever. It seems we don't get any new people or new ideas. SAC needs to rotate their people more than they do; at least in missiles.

The majority of comments in tier 2 indicated the desirability of long tours. Tier 3 had seven negative and five positive statements. All the positive statements were about stability. One negative statement mentioned that long tours are hard on younger personnel who tend to be more restless. Other negative statements indicated a desire for longer tours, with a home basing program.

Summary

The first method of analysis indicated a vast spectrum of problem areas exist in missile maintenance. This method indicated that enlisted missile maintenance personnel only directly discussed the transition from technician to supervisor an equivalent of thirty-four line units. The total discussion by these personnel was almost 10,000 line units, when calculated using the categorization method employed by AF/HRL. The statements were categorized up to three times each, so these numbers do not necessarily indicate the exact proportions. However, the discussion of this area is relatively small when compared to the majority of other categories.

The second method of analysis covered 105 of the categories. Of those, only forty contained enough

statements for a complete analysis. In these forty categories, many of the comments that could be linked to the forced transition from technician to supervisor were also in the section on unwanted supervisory roles. This category contained a total of eight comments. Of these, four emphasized management problems with the current system, not necessarily problems with the forced transition. Two others mentioned temporary alternatives to transitioning that the individuals had already considered: a different job dispatching to the field; or a different career field. Both methods of analysis revealed a relatively small amount of concern over the forced transition from technician to supervisor relative to the spectrum of problems in missile maintenance.

CHAPTER VI

CONCLUSIONS AND RECOMMENDATIONS

The results indicated that the forced transition from technician to supervisor in the Air Force promotion system has not created extensive problems in Minuteman missile maintenance. Very few individuals made statements about the requirement for enlisted personnel to develop supervisory skills and move away from technically oriented work. The severity of other problems identified by these personnel appeared to override this transition issue. The problems created by low experience levels and manning shortages in the middle tier had an impact on this transition. However, most individuals did not express concern over having to move into supervisory roles. Rather, many appeared to anticipate the move with expectations of better working conditions and higher status within the organization.

The results did not reveal the same extent of attachment to the "hands-on" type work generally accorded to aircraft personnel. Several missile maintenance personnel did express their desire to see a more visible result of their work by referring to test launches. Most, however, discussed other issues that appear to impact

maintenance production in a more direct way. The career progression system does not appear to be a significant limiting factor as in other career fields (Chapin & Suarez, 1981:112).

The comments on the training for supervisory roles were also limited but did indicate a desire for more comprehensive coverage and at lower levels. The fact that the role of team chief is carried by younger, less experienced personnel has drawn attention to the need for more education at earlier points in career progression. An evaluation of this issue is currently being conducted at Air Force level and consideration for combining Phases I and II of PME is under way (Roberts; Johnson).

One statement referenced the Army promotion system. This system uses a dual track, allowing technicians the choice of career progression into supervisory roles or technical specialist positions. This system is similar to one recommended for the Air Force by Booker and Moxley (1982:93). However, according to Dennis Campbell, a retired Army maintenance officer, the Army system is experiencing some significant problems. Enough so that serious debate regarding its continuation is ongoing. Specifically, the use of the career technicians complicates chain of command issues when lower ranking NCOs, the Army supervisors, are placed over higher ranking specialists. Minuteman maintenance personnel are already experiencing

problems with organizational policies regarding the roles of its supervisors: specifically team chief, flight NCO, and flight officer relationships.

To improve the system through proper change is the desirable goal. The course of such change is influenced by our understanding of the elements within the system and how they are related to each other. The differences in relationships are critical. In view of the results of this research, further study regarding the differences between Minuteman missile maintenance and aircraft maintenance environments is advisable. These environments, although they include similarities, have differences which may critically affect the outcome of decisions by higher management. Research is needed to highlight areas which have implications regarding the proper development and implementation of efficient and effective organizational structure, policies, and procedures, and the implementation of technologies. Such research will help insure the maintenance mission: equipment readiness (AFR 66-1, 1983:5).

APPENDIX
DATA COLLECTION FORMS

PRIVACY STATEMENT

In accordance with paragraph 30, AFR 12-35, the following information is provided as required by the Privacy Act of 1974.

A. This interview is part of an effort by the Air Force Human Resources Laboratory (AFHRL) to explore various alternatives for improving maintenance operations. The interview provides an avenue of communications between the individuals directly involved in maintaining Air Force equipment and AFHRL. The information gathered in these interviews will be used to generate possible improvements in maintenance and personnel procedures and environment.

B. Your participation in this interview is entirely voluntary. If you choose to participate, you are encouraged to provide complete and accurate information, in the interests of improving the maintenance job and the psychological climate in which it is performed. However, no adverse action of any kind will be taken against any individual who declines to provide any or all of the information requested.

C. Your participation in this study will be strictly anonymous. The information you provide will be combined with information from other participants. Full confidentiality of your responses will be maintained in processing the data and in reporting the results. Your name or organization will not be associated with the information you provide, in any resulting report.

D. If you choose to participate in this interview, please sign below to indicate that you have read this statement.

E. If you wish, you may retain a copy of this notice. Simply detach and keep the second sheet of this form.

Signature _____ Date _____

0026 BIOGRAPHICAL DATA

(1) BASE CODE: _____ NAME: _____ (2) SUBJ #: _____
(3) AGE: _____ (4) SEX: _____ (5) RACE: _____ (6) MAR. STATUS: _____
(7) MIL. SPOUSE: _____ (8) # DEP. CHILD: _____
(9) PREFIX: _____ (10) AFSC: _____ (11) SUFFIX: _____ (12) SEI: _____
(13) JOB TITLE: _____
(14) MIL/CIV CODE: _____ (15) MIL GRADE: _____ (16) CIV GRADE: _____
(17) DUTY TYPE: _____ (18) AFRES/ANG STATUS: _____
(19) TIME IN SERVICE: _____ months (20) TIME IN MAINT: _____ months
(21) TIME SINCE HANDS-ON: _____ months (22) TIME IN SUPV: _____ months
(23) R/A TIME IN ACTIVE DUTY: _____ (24) R/A TIME SINCE ACTIVE DUTY: _____
(25) CMD/AGCY CODE: _____ (26) CMD LEVEL CODE: _____
(27) ORGANIZATION-POSITION DATA: 66-5(1) _____ 66-1(2) _____

DCM(01) _____ MMICS(02) _____ ADMIN(03) _____ PRO/MOB(04) _____
TNG. MGT(05) _____ PROD. ANAL(06) _____ QC/QA(07) _____
PLANS/SCHED-DOC(08) _____ JOB CON(09) _____ MAT CON(10) _____
AGS(21) _____ EMS(22) _____ CRS(23) _____
OMS(31) _____ FMS(32) _____ AMS(33) _____ MMS(34) _____

UNCODABLE(44) _____ (28) SUPPLEMENT: _____

(29) SQUADRON: _____ (30) WEAPONS SYSTEMS: _____
(31) INT. DATE: _____ y _____ m _____ d (32) TIME: _____
(33) INTERVIEWER: _____

0026 BIOGRAPHICAL DATA

(1) Base (2) Subject No. (3) (4) Age (5) Sex (6) Race (7) Mar. Status (8) MIL Spouse (9) No. Dep. Child.

(9) Prefix (10) AFSC (11) Suffix (12) SEI

(13) Job Title

(14) MIL/CIV Code (15) MIL Grade (16) CIV Grade (17) Dutv Type (18) Res/Ang Status

(19) Time In Service (20) Time In Maint (21) Time Since Hands-On (22) Time In Supv (23) Res/Ang Time In Active (24) Res/Ang Time Since Active

(25) CMD/Amy. Code

(26) CMD Level Code

(27) Organization Code (28) Organization Code Supplement (Use if No. 27 144 or 244)

(29) Squadron (30) Weapons System

(31) Interview Date (32) Time (33) Interviewer (34) No. of Sims

STATEMENT CODING FORM
0026 STATEMENT DATA

ב-1956 _____ סטטוס: _____

Statement No. _____

CLASSIFICATION

Transistor • • • CR 1000 CASTI

Sample 3:

CLASSIFICATIONS

SELECTED BIBLIOGRAPHY

A. REFERENCES CITED

Booker, Captain A. K., and Second Lieutenant I. D. Moxley, USAF. "Recommended Changes to the United States Air Force Enlisted Career Progression System." Unpublished master's thesis. LSSR 46-82, AFIT/LS, Wright-Patterson AFB OH, September 1982.

Campbell, Dennis E. Instructor, School of Systems and Logistics, Air Force Institute of Technology (AU), Wright-Patterson AFB OH. Personal interview. 10 August 1983.

Campbell, Wendy, and Andrew P. Chenzoff. "A Qualitative Methodology for Studying Air Force Maintenance." Unpublished report, Air Force Human Resources Laboratory, Logistics and Technical Division, Wright-Patterson AFB OH, January 1982.

Cason, Major Thomas O., USAF. "The Instruments of National Policy," Phase I: National Security Process, Squadron Officer School (AU), Department of the Air Force, Maxwell AFB AL, 1983, pp. 44-56.

Chapin, Captain Ronald J., USAF, and Captain Luis Suarez, USAF. "An Evaluation of the Current United States Air Force Enlisted Career Progression System and Air Force Structure." Unpublished master's thesis. LSSR 8-81, AFIT/LS, Wright-Patterson AFB OH, June 1981. AD A10351.

Chenzoff, Andrew P., and Reid P. Joyce. "Maintenance Environment Improvement Analysis: Phase II--Pretest." Unpublished research report No. AFHRL-TP-8132, Air Force Human Resources Laboratory, Logistics and Technical Training Division, Wright-Patterson AFB OH, January 1982.

Cohen, Victor H. "The Nation-State System: Past and Future," Phase I: National Security Process, Squadron Officer School (AU), Department of the Air Force, Maxwell AFB AL, 1983, pp. 9-23.

Dilla, Captain Ben L., USAF. Instructor, School of Systems and Logistics, Air Force Institute of Technology (AU), Wright-Patterson AFB OH. Personal interview. 9 August 1983.

Folkeson, Major John R., USAF. Instructor, School of Systems and Logistics, Air Force Institute of Technology. Class notes Logistics Management LM 5.42, 2 July 1982 through 17 September 1982.

Gabriel, General Charles A., USAF. "Of Forces and Flinching," Air Force Magazine, May 1983, pp. 70-72.

Gray, Collin S. The MX ICBM and National Security. New York: Praeger Publishers, 1981.

_____. "Why Does the United States Need ICBMs," NATO's Fifteen Nations, August 1982 to September 1982, pp. 80-84.

Grimard, Lieutenant Colonel Lawrence N., USAF. "Maintenance Management," Managing the Air Force, Air War College research report, Maxwell AFB AL, 1980, pp. 278-301. AD B043045.

Hartman, Frederick H. "The Elements of National Power," The Relations of Nations. New York: The Macmillan Company, 1967, pp. 41-65.

Hiatt, First Lieutenant Terry G., USAF, and Captain Wayne E. Nunnery, USAF. "An Exploration of Alternatives to the Current USAF Enlisted Career Progression System." Unpublished master's thesis. LSSR 39-81, AFIT/LS, Wright-Patterson AFB OH, June 1981. AD A105546.

Huston, James A. The Sinews of War: Army Logistics 1775-1953. Office of Military History, United States Army. Washington: Government Printing Office, 1966.

Johnson, Master Sergeant Thomas L., USAF. Base Career Advisor, Wright-Patterson AFB OH. Personal interview. 17 April 1983.

Kane, William D. "A Systems View of Maintenance Performance," Air Force Journal of Logistics, Fall 1981, pp. 20-24.

Konarik, Ronald B., and Wayne Reed. "A Military Approach: Work Environment Improvement Teams," The Quality Circles Journal, February 1982, pp. 10-15.

McCann, Colonel John A., USAF (Ret.), and others. Compendium of Authenticated Systems and Logistics Terms, Definitions and Acronyms, AU-AFIT-LS-3-81, AFIT, Wright-Patterson AFB OH, 1981.

Mangrum, Claude T. "Making the Transition to Supervisor," Supervisory Management, September 1978, pp. 7-13.

Miles, Matthew B. "Qualitative Data as an Attractive Nuisance: The Problem of Analysis," Administrative Science Quarterly, December 1979, pp. 590-596.

Morgenthau, Hans J. "Elements of National Power," Politics Among Nations. New York: Alfred A. Knopf, 1967, pp. 106-144.

MX Missile Basing. Washington: Congress of the United States Office of Technology Assessment, September 1981.

Organski, A. F. K. "Natural Determinants of Power," World Politics. New York: Alfred A. Knopf, 1968, pp. 124-154.

Patchin, Robert I. "Stairway to the Stars, or . . .," The Quality Circles Journal, February 1982, pp. 10-15.

Patton, Michael Q. Qualitative Evaluation Methods. London: Sage Publications, Inc., 1980.

Pierce, Captain Gary W., USAF, and Captain Erika A. Robeson, USAF. "Attitudes and Opinions of USAF Jet Engine Personnel Concerning Enlisted Career Progression." Unpublished master's thesis. LSSR 2-80, AFIT/LS, Wright-Patterson AFB OH, September 1980. AD A08744.

Pitkin, Chief Master Sergeant Danny G., USAF. Missile Enlisted Functional Manager, Headquarters Strategic Air Command (HQ SAC/LGBA). Telephone interview. 22 July 1983.

Roberts, Senior Master Sergeant Irwin R., USAF. NCOIC Personnel Division, Wright-Patterson AFB OH. Personal interview. 17 April 1983.

Schneider, William, Jr., and others. U.S. Strategic Nuclear Policy and Ballistic Missile Defense: The 1980s and Beyond. Washington: Corporate Press, Inc., 1980.

Schoderbek, Charles G., Peter P. Schoderbek, and Asterios G. Kefalas. Management Systems: Conceptual Considerations. Revised ed. Dallas: Business Publications, Inc., 1980.

Sellitz, Claire, and others. Research Methods in Social Relations. New York: Holt, Rinehart, and Winston Publishers, 1976.

Shiroyama, Major Brian Y., USAF. "Guide for New Security Police Officers." Unpublished report, Air Command and Staff College (AU), Maxwell AFB AL, May 1980. ADB 057563.

Snow, Donald M. "International Relations and the Military Environment," Phase I: National Security Process, Squadron Officer School (AU), Department of the Air Force, Maxwell AFB AL, 1983, pp. 24-30.

Squadron Officer School. "Determinants of National Power," Phase I: National Security Process, Department of the Air Force, Maxwell AFB AL, 1983, pp. 32-42.

Stoessinger, John G. World Politics in Our Time: The Might of Nations. New York: Random House, 1982.

Strategic Air Command. ICBM Missile Maintenance Management, Vol. I: Policy and Supervisory Responsibilities. SACR 66-12. Washington: Government Printing Office, 12 August 1981.

. ICBM Missile Maintenance Management, Vol. II: Maintenance Support Division. SACR 66-12. Washington: Government Printing Office, 10 August 1981.

. ICBM Missile Maintenance Management, Vol. III: Maintenance Control Division. SACR 66-12. Washington: Government Printing Office, 26 November 1979.

. ICBM Missile Maintenance Management, Vol. IV: Training Control Division. SACR 66-12. Washington: Government Printing Office, 28 September 1982.

. ICBM Missile Maintenance Management, Vol. V: Quality Control and the Maintenance Standardization and Evaluation Program. SACR 66-12. Washington: Government Printing Office, 11 August 1981.

. ICBM Missile Maintenance Management, Vol. VI: Maintenance Squadrons. SACR 66-12. Washington: Government Printing Office, 15 September 1981.

"Strategic Missiles," Air Force Magazine, May 1983, pp. 158-159.

Taylor, Maxwell D. "Can We Depend on Deterrence?" The Washington Post, 30 June 1981, Section A, p. 17.

Terry, Kathleen. "Quality Circles--An Exciting Proposition!" IAQC, The Quality Circle Quarterly, First Quarter 1980, pp. 12-21.

U.S. Department of the Air Force. Air Force Logistics Doctrine. AFM 400-2. Washington: Government Printing Office, 1968.

_____. The Enlisted Force Organization. AFR 39-6M. Washington: Government Printing Office, 1977.

_____. Enlisted Performance Reports. AFR 39-62. Washington: Government Printing Office, 1981.

_____. Equipment Maintenance Policies, Objectives, and Responsibilities. AFR 66-14. Washington: Government Printing Office, 1978.

_____. Functions and Basic Doctrine of the United States Air Force. AFM 1-1. Washington: Government Printing Office, 1979.

_____. Maintenance Management Policy. AFR 66-1, Vol. I. Washington: Government Printing Office, 1983.

_____. Noncommissioned Officer Professional Military Education and Civilian Initial Supervisory Training. AFR 50-39. Washington: Government Printing Office, 1981.

_____. The USAF Personnel Plan, Vol. I: Personnel Management Objectives. Washington: Government Printing Office, 1981.

Yager, Ed. "Examining the Quality Control Circle," Personnel Journal, October 1979, pp. 682-684.

B. RELATED SOURCES

Blackwell, Lieutenant Colonel Paul E., USA. "Taking Care of Soldiers." Unpublished student essay. U.S. Army War College, Carlisle Barracks PA, March 1983. AD A127862.

Brennan, Donald G., and others. "U.S. Strategic-Nuclear Policy and Ballistic Missile Defense: The 1980s and Beyond." Special report, Cambridge MA and Washington DC: Institute for Foreign Policy Analysis, Inc., April 1980.

Connell, Captain Robert D., USAF, and Captain Daniel L. Wollam, USAF. "Measuring Aircraft Maintenance Effectiveness within the United States Air Force." Unpublished master's thesis. SLSR-43-68, AFIT/SL, Wright-Patterson AFB OH, 1968. AD A103785.

Draughn, Pearlie M. "Minuteman's Third Decade: Our Thousand Aces in the Hole," Air Force Magazine, January 1983, pp. 64-66.

Hall, Francis J., and Captain Clark K. Nelson, USAF. "A Historical Perspective of the United States Air Force Enlisted Personnel Promotion Policy." Unpublished master's thesis. LSSR 53-80, AFIT/LS, Wright-Patterson AFB OH, June 1980. AD A08877.

Herz, John H. International Politics in the Atomic Age. New York: Columbia University Press, 1959.

Hyman, Herbert Hiram, and others. Interviewing in Social Research. Chicago: University of Chicago Press, 1954.

McAlpin, Captain Norman B., USAF, and Captain Lawrence J. Vaccaro, Jr., USAF. "A System Simulation of the Execution of Scheduled Maintenance at a Minuteman Missile Wing." Unpublished master's thesis. LSSR 24-82, AFIT/LS, Wright-Patterson AFB OH, September 1982. AD A122820.

Mullins, General James P., USAF. "While We Argue, Soviets Prepare," The Journal Herald, Dayton OH, 21 July 1983, p. 9.

Richter, Captain Edward E., USAF, and Captain David C. Tharp, USAF. "A Comparative Analysis of Enlisted Career Progression Systems." Unpublished master's thesis. LSSR 51-80, AFIT/LS, Wright-Patterson AFB OH, June 1980. AD A08876.

Rue, Leslie W., and Lloyd L. Byers. Supervision: Key Link to Productivity. Homewood IL: Richard D. Irwin, Inc., 1982.

Ulsamer, Edgar. "SAC Backs Small ICBM," Air Force Magazine, August 1983, pp. 20-24.

U.S. Department of the Air Force. Military Training Standard/Promotion Fitness Examination. AFP 50-34. Washington: Government Printing Office, 1 October 1982.

Weinberger, Casper W. "Why We Must Have a Nuclear Deterrent," Defense /83, March 1983.

BIOGRAPHICAL SKETCH OF THE AUTHOR

Captain Donald R. Forbes served as a Minuteman Missile Launch Officer prior to his assignment to AFIT. He served for two years as a Deputy Missile Combat Crew Commander, one year as a Combat Crew Commander, and one year as a Wing Nuclear Surety Officer. His next assignment is to the 351st Strategic Missile Wing as a Minuteman Missile Maintenance Officer.

